MEETING THE CHALLENGE: BUILDING THE CAPACITY OF TEACHERS OF THE DEAF TO AFFECT IMPROVED STUDENT OUTCOMES

A disquisition presented to the faculty of the Graduate School of
Western Carolina University in partial fulfillment of the
Requirements for the degree of Doctor of Education

By

Kristin Nicole Todd

Committee Chair: Dr. Jessica Weiler
Assistant Professor and Program Director
Educational Leadership
Department of Human Services

Committee Members:
Dr. Robert Crow, Educational Leadership
Dr. Jonathan Henner, Specialized Education Services
Dr. Johanna Price, Communication Sciences and Disorders

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throughout this program and for planting revolutionary seeds of phronesis. I owe a genuine debt of gratitude to Dr. Jessica Weiler, who inspires me to engage in the relentless pursuit of social change in education. Your pledge to this labor has most certainly enriched the lives of many, mine included.

Dedication

This work is dedicated to my students: current, former, and future. You are truly exceptional. You are spirited and strong. You surmount significant adversity with hope and brightness. I thank you for all you have given me.

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Abstract

Children who are Deaf and Hard of Hearing (D/HH) present with specific challenges in language acquisition and literacy learning. For these children, developing age-appropriate language and literacy skills is often the exception, not the rule. This study defines the complex problem of disproportionate language and literacy acquisition and subsequent achievement outcomes D/HH individuals, when compared to their non-D/HH peers and illustrates a significant opportunity gap.

To combat this imbalanced achievement and consequential limitations in adulthood, I aimed to enhance students at the North Carolina School for the Deaf's access to educators able to meet them where they are and employ interventions established in research to support substantial growth in language and reading. My theory of improvement maintains that: *Equipping educators to identify, choose, and implement evidence-based interventions, with support, will enhance their self-efficacy and ability to meet the immediate language and literacy- learning needs of D/HH students, thus mitigating disparate academic performance outcomes.*

This was proposed to manifest in improved overall academic achievement, breaking down barriers provided by the current opportunity gap, and enhancing social justice for this marginalized group.

Keywords: Deaf and Hard of Hearing (D/HH), language and literacy, disparate achievement, evidence-based interventions, teacher self-efficacy

The Disquisition

Candidates seeking the Executive Doctor of Education (EdD) degree in Western Carolina University's program in Educational Leadership lead a final disquisition project. WCU is an affiliate of the Carnegie Project on the Education Doctor (CPED), having constructed a CPED-based doctoral program that focuses on both leadership and inquiry.

In contrast to a traditional, theoretically driven dissertation associated with programs awarding Doctor of Philosophy (PhD) degrees in education, WCU's disquisition provides an opportunity for scholar practitioners to demonstrate the use of research in solving applied problems. Rationale for the disquisition centers on the fact that preparation for an individual receiving a research doctorate should differ from the training an individual pursing a professional practice doctorate receives (Lomotey, 2018, p.2).

Thus, the disquisition focuses on exploration of a candidate's chosen *problem of practice* and the application of research and improvement science in mitigating that problem. Here the candidate serves two roles: that of the disquisitioner or scholar tasked to examine the process of improvement, while simultaneously serving as facilitator or practitioner of the improvement process itself.

Meeting the Challenge: Building the Capacity of Teachers of the Deaf to Affect Improved Student Outcomes

Language is the vehicle we, as humans, use to make meaningful connections with one another and develop relationships. We use language to assign labels, describe feelings, communicate directions, and make general sense of our world. A strong foundation in language enables further learning and success across the lifespan. Literacy is conventionally regarded just as central to accomplishment as the language that precedes it. Here, literacy is conceptualized by an *autonomous ideology*, describing print literacy skills learned as one advances through universal phases of development (Bartlett, 2007).

D/HH individuals, though, are a diverse group with various identities. Differences exist linguistically, culturally, and relative to the presence or absence of disability (Guardino & Cannon, 2016). They are users of American Sign Language or English in exclusivity, bilingual/bimodal American Sign Language and English users, and/or individuals who are multilingual, using American Sign Language, English, and the home language of their families. All communicate receptively and expressively along a proficiency continuum of visual and auditory reception and sign and oral expression.

Deafness presents unique challenges in language and literacy development. When a spoken language is the communication modality of the home for a child who is D/HH, their ability to receive their families' full messages is hampered. When parents and families do not ensure that the language of the home is comprehensible, that child experiences either incomplete or absolute denial of language access. It is estimated that 90% of children born D/HH are born to hearing parents who most likely do not know

sign language (Spellun & Kushalnagar, 2018). Many D/HH students, therefore, begin their school years deprived of foundational linguistic skills and world knowledge, given their scarce exposures to proficient language models. Their assimilation of concepts learned incidentally is piecemeal and students present with disadvantaged readiness for development in functional communication, play, thinking, and socialization. While D/HH students present with these hardships, we refuse to hold them responsible for life experiences and inaccessibility beyond their control. Instead, we strive to illuminate the issues of access and language deprivation via a systems lens.

Nonetheless, the customary expectation is that D/HH children will map a second language, written English, to an already deprived first and become print literate, in the autonomous sense (Hoffmeister & Caldwell-Harris, 2014). Street (1993) portrays an *ideological model of literacy*, one that respects the intricacies of literacy intertwined with the cultural and power structures of a society, and deliberating on the social use of reading and writing, in various contexts. Bartlett (2007) continues, noting there is a "multiplicity of literacies" and that what is deemed as literacy is a result of sociocultural negotiations. Per the ideological model, we recognize a number of literacies exist and are no doubt significant. Proficiency in other literacies as a demonstration of success is often passed over in education, though, as evidenced in traditional assessment consistently concerned with students' print literacy or reading ability.

Still, adequate print literacy governs a student's success in school by determining their ability to use written English as a tool for learning. For D/HH individuals, language deprivation contributing to complications reading and writing English effectively, in the

autonomous ideology, obstructs knowledge and expression in all school subjects, generating an unrelenting opportunity gap.

Problem of Practice

National Context

A few years ago, Deaf education celebrated its 200-year anniversary in the United States, in aggregation to the establishment of the first permanent school, now the American School for the Deaf. In April of 1817, Thomas Hopkins Gallaudet opened the American Asylum at Hartford for the Education and Instruction of the Deaf and Dumb. The introduction of the Asylum also inaugurated a standardized language, American Sign Language, and a Deaf community and culture. The Asylum's first student was Alice Cogswell (History and Cogswell, n.d.).

Despite the age of the discipline and advancements in hearing technologies, D/HH individuals are continually deprived of accessible language and struggle to overcome the obstacles of language deprivation and consequent impoverished literacy. This, situated in a historical culture of audism, discrimination of Deaf people due to beliefs that an inability to hear makes one inferior (Bauman, 2004), powers inequitable achievement and employment outcomes for D/HH individuals.

Garberoglio et al. (2016) describe principal education and employment outcomes in the United States for D/HH individuals. According to their findings, D/HH individuals present with higher school dropout rates (>25%), compared to individuals not identified as D/HH (< 10%). College and University dropout rates for D/HH individuals are approximately 70%, compared to approximately 40% of students who are not identified as D/HH. The combined under- and unemployment rates for D/HH individuals is >70%,

compared to <20% of individuals who are not identified as D/HH. There is a significant imbalance amongst D/HH individuals regarding labor force involvement. Nearly half of D/HH individuals (47%) are not considered to be 'in the labor force', compared to less than 23% of individuals who are not identified as D/HH. D/HH individuals who are employed are most commonly working in the manufacturing (13.2%) and construction (9.8%) fields, while individuals not identified as D/HH are predominantly employed in the medical (13.7%) and professional services (11.4%) fields. Figure 1 below depicts relative education and employment outcomes for D/HH individuals.

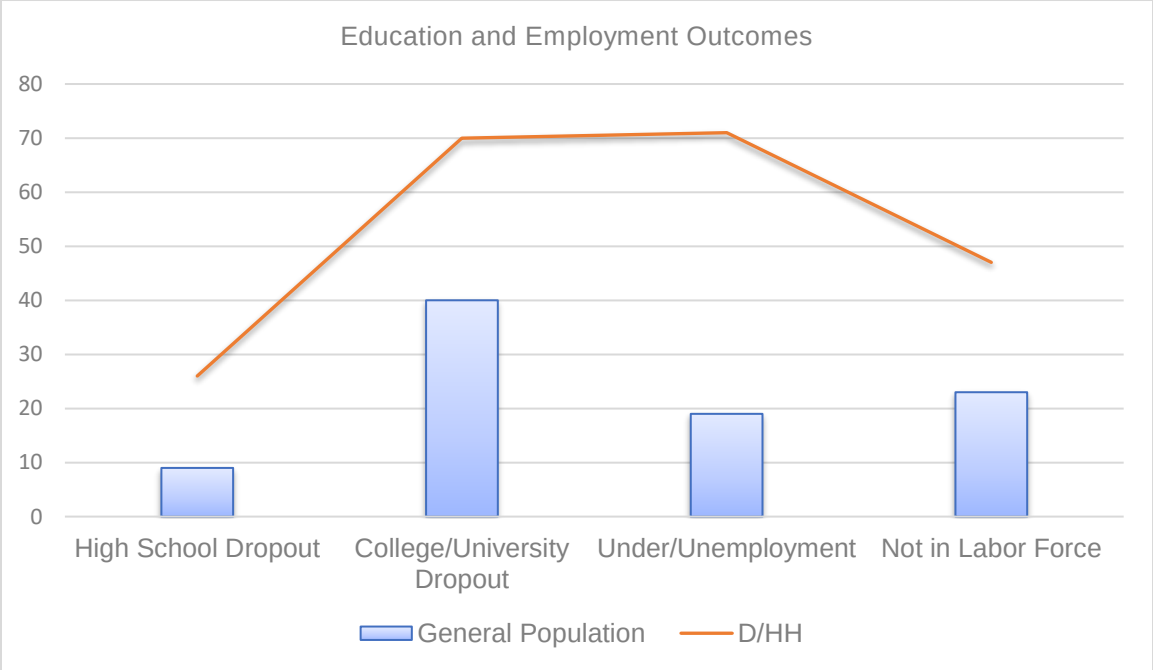


Figure 1. Education and employment outcomes for D/HH individuals (Garberoglio et al., 2016).

Causal Analysis: What is the Specific Cause We Are Trying to Tackle?

Byrk et al. (2015) term the process that allows one to approach the complexities and substances in the inadequate results of our educational organizations a *causal system analysis*. This work is foundational for appreciating specific problems and their milieus and for deciding on and trialing meaningful change. Bryk et al. (2015) further advises to engage diverse viewpoints when attempting to fully see the system. Thus, I asked my colleagues to provide their individual insights in analysis of the problem.

Further, the concept of networked improvement communities (NICs) describes a group of people organized to resolve a common challenge (Byrk et al., 2015). I presented an essentially blank diagram to my group of folks organized to attack the problem of disparate achievement for D/HH students, my design team. This meeting occurred in August and began by noting only the problem of practice, *"The acquisition of language, literacy, and subsequent academic achievement for students who are D/HH is consistently below their non- D/HH peers, contributing to an opportunity gap."* I explained that our first objective would be to identify two "major bones" contributing to the problem. I lead an half-hour discussion, repeatedly asking, "why?" to help my design team drill down two major causes. I did my best not to influence the direction of the discussion that ensued. With like minds, the team arrived, on their own, at 'language deprivation' and a version of 'access to the curriculum' as two primary roots of disparate achievement D/HH students. During their discussion, all "major bones" that I had previously identified in my own causal analysis were mentioned. I followed their initial discussion, in the same meeting, by presenting my completed fishbone diagram and asked for confirmations and disputes. The team reviewed the diagram and validated my evaluation. The accompanying figure is a design team approved *fishbone diagram* (Byrk

et al., 2015), providing a causal analysis of the steady, disparate academic achievement of D/HH students.

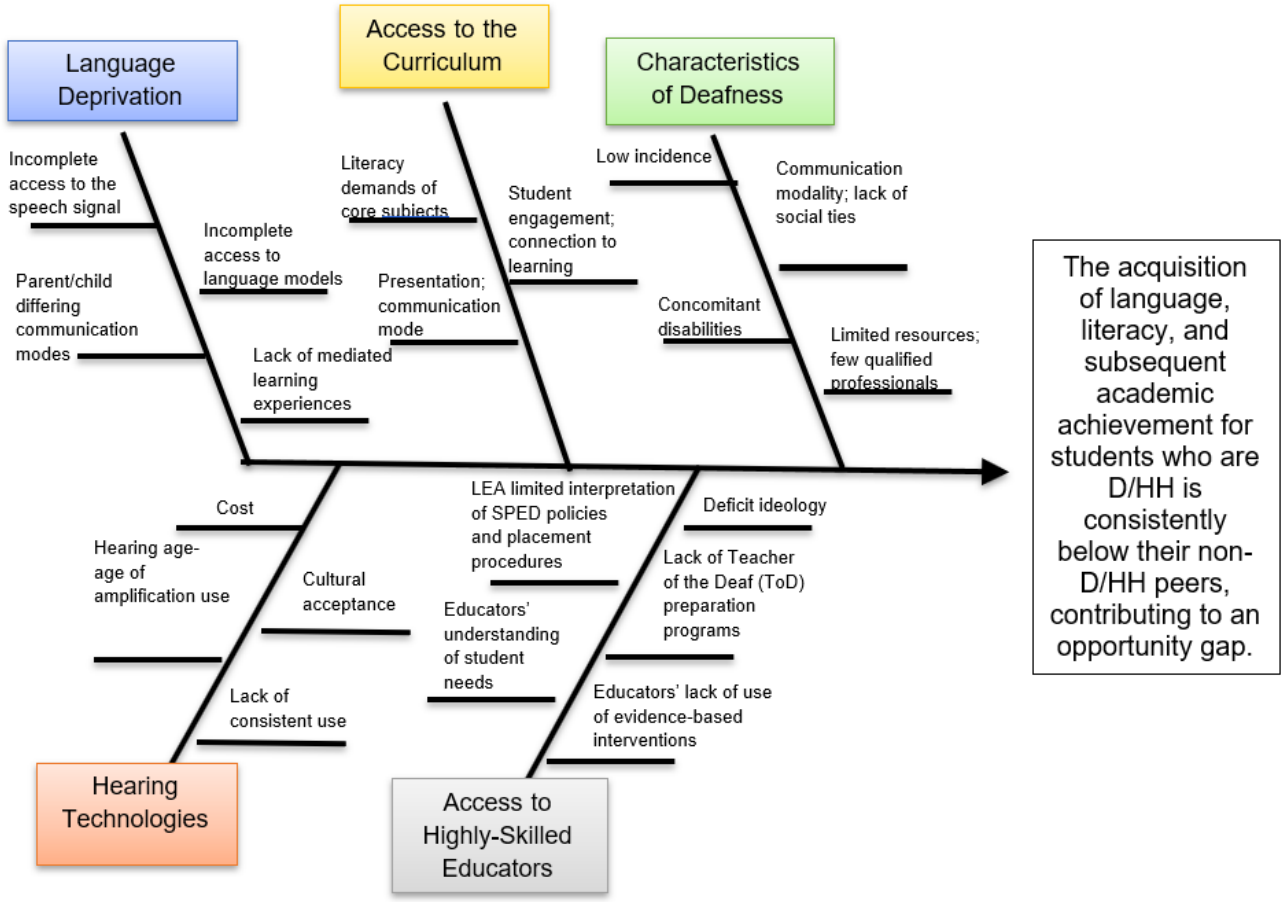


Figure 2. Causal analysis. Fishbone diagram of contributing factors for meager academic achievement.

Literature Review of the Causes

Language Deprivation. Our brains are hard-wired for language acquisition, specifically in our earliest years. The age span of early childhood has been deemed by child development experts and linguists as the critical period, the temporal phase when one is "exquisitely sensitive" to specific language-learning stimuli (Mayberry &

Kluender, 2017). It is well-known that children learn language through natural, mediated interactions and fully accessible linguistic experiences during the critical period is central to inspiring D/HH children's full potentials (Hall et al., 2019). Luckner, Bruce, et al. (2016) point to the importance of a child's access to interactions with skilled language models, during the critical language-learning years, as the most significant influence on a child's language development.

With hearing loss, a child experiences incomplete access or denial of information carried through spoken signals. It is estimated that 90% of children born D/HH are born to hearing parents who most likely do not know sign language. Further, 75% of those parents never become fluent users of sign language (World Federation of the Deaf, 2016). Unfortunately, most children with hearing loss experience substantial deficits in frequency of communication exchanges (Luckner, Bruce, et al., 2016). Szymanski et al. (2013) confirm that the highest concern in language acquisition for children who are D/HH is the need for early access to language. Often, a child who is D/HH is denied complete access to formal communication until they reach school-age (Shantie & Hoffmeister, 2000).

Incidental assimilation of thousands of words, common expressions, and rules of grammar and syntax occurs effortlessly when a young child has complete access to communication. Missed opportunities for language stimulation in the earliest years present a challenging feat of remediation.

Access to the Curriculum. The Individuals with Disabilities Education Act Amendments of 1997 demand that all students are enabled to access, participate, and progress within the general education curriculum. Yet, the print literacy demands of the

curriculum itself and the inadequacies of most ToD to adapt the curriculum and support students' to proficiency employing print literacy as a tool for learning present barriers to curriculum access for most students who are D/HH.

Students who are D/HH who use sign language for communication and learn written English as an entirely secondary language, with incomplete or no admission to the auditory foundations and social use of spoken English. With a curriculum that demands students to be proficiently print literate, students who are D/HH are often discouraged by their struggles and experience a lack of engagement with learning. Due to missed incidental exposures, D/HH students also lack proximal world knowledge necessary to grasp new concepts and gain meaning from presented learning activities. The vocabulary demands of the curriculum increase as students move through school and new knowledge, in most subjects, builds on previously mastered vocabulary, concepts, and processes.

English is a language with spoken, signed, and written modalities. A hearing child's intact auditory system allows them access to the phonology, the sound system of the English language via access to the modality of spoken English. This phonological perception is typically deemed critical for learning to read in the alphabetic languages, such as English (Anthony & Francis, 2005). Orthographic representation, English in its written form, exemplifies spoken phonemes. Pratt and Brady (1988) conclude that phonemic awareness is essential to understanding the principles of an alphabetic orthography. Though D/HH children, with no little or no access to phonology, can and do become proficient readers despite characteristic difficulties of learning English through the written modality alone (Hoffmeister & Caldwell-Harris, 2014).

Further, D/HH students may not receive curricular instruction in their language of communication. According to the World Federation of the Deaf (2016) only 2% of students who are D/HH worldwide, are privy to direct instruction in sign language. The field of Deaf education is one with historical biases, given passionate philosophical assumptions of superiority of communication mode. Listening and spoken language exclusivity versus manual communication and the use of American Sign Language is an on-going and unfortunate debate that has lasted since the late 19th century, perpetuating the opportunity gap (Kushalnagar et al., 2010). Additionally, the common misconception that all individuals who are D/HH are proficient lipreaders of spoken language further contributes to divested access. Most students who are D/HH are educated with limited service provision by Teachers of the Deaf/Hard of Hearing (ToD/HH) and unreliable supports of sign language interpreters who may or may not be licensed, significant barriers that hamper participation and interaction in inclusion settings (Cerney, 2007). Moreover, because their language of communication differs from their peers, when students are afforded qualified sign language interpreters, they may continue with missed social learning opportunities, as the thoughts, interjections, and discussions of their peers are minimally accessible (*Teachers College Record*, 2007).

Characteristics of Deafness. Children who are D/HH are a diverse group. Variance exists in communication modality, age of identification, intervention history and access to services, the presence or absence of additional special needs, and technology use (Smith & Allman, 2019). Further, it is estimated that 96% of children born D/HH are born to hearing parents who likely know little about sign language and deafness (Kushalnagar et al., 2010). Consistently, demographic reports suggest that 40-

45% of individuals who are D/HH present with a concomitant disability (GRI, 2013). Weily and Moeller (2007) maintain that "the combination of deafness and an additional disability is multiplicative rather than additive, complicating the goal of helping children to meet their full potential" (p. 8). Figure 3 illustrates a comparison between high school completion results for individuals who are D/HH against those who are "Deaf with Disability (DWD)" or individuals who are D/HH, presenting with concomitant challenges.

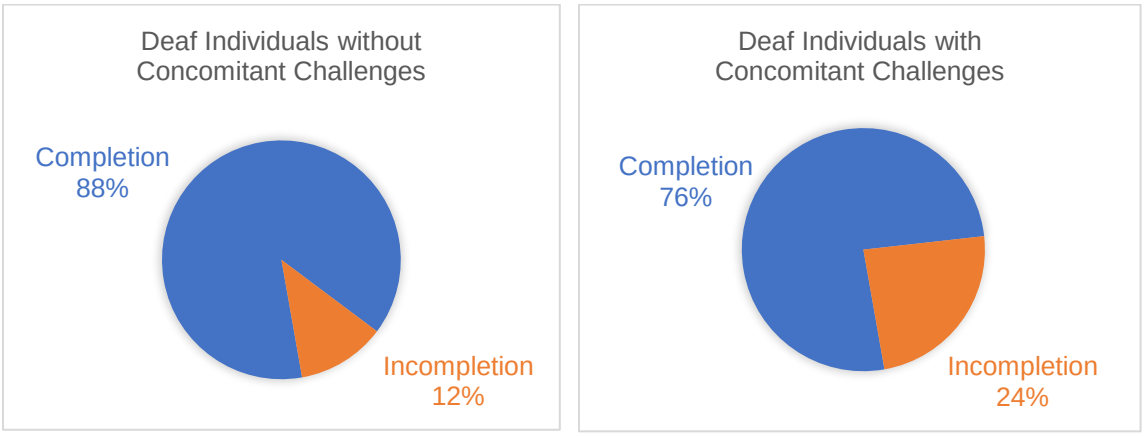


Figure 3. Comparison pie charts. These graphs depict high school completion rates for individuals who are D/HH with and without additional disabilities (Garberoglio et al., 2017)

Language-learning environments vary and are categorized as those promoting sign language, simultaneous communication, and spoken language. Diversity further exists within these environments, as children communicate receptively and expressively along a continuum of visual and auditory reception and sign and oral expression. The development of social ties with others is more difficult for individuals who are D/HH, due to communication barriers (Marschark & Spencer, 2010).

Additional factors that diversify the population, as with all children include: "parental involvement, socio-economic status, access to quality early childhood education, and support from the community and extended family" (Lederberg et al., 2013, p. 18). Limited access to resources and knowledgeable professionals is also a result of the low-incidence of hearing loss and contributes to continued dismal academic achievement outcomes and the opportunity gap.

Hearing Technologies. As with other medical treatments, the costs of obtaining hearing technologies such as hearing aids and cochlear implant devices are a consideration in a family's access. These technologies are expensive, with the average cost of hearing aids ranging $1,000- $4,000 per device, and cochlear implants ranging $30,000-$50,000 per device (Healthy Hearing, 2018). Medicaid and private insurances can cover, in whole or in part, hearing technologies for children, with stipulations. North Carolina is one of 23 states with state insurance mandates for hearing aids (ASHA, 2011). The general statute provides for "one hearing aid per hearing-impaired ear up to two thousand five hundred dollars ($2,500) per hearing aid every 36 months for covered individuals under the age of 22 years", subject to deductibles, coinsurance, and other limitations (N.C. G.S. §58-3-285).

A child's hearing age or length of time with consistent access to hearing technologies presents another variable in achievement. Marschark et al. discusses early amplification or implantation and "the expectation that enhanced phonemic awareness and phonological processing skills will result in better reading abilities among children (with cochlear implant devices) relative to peers without implants" (p. 269). The perception is that children who are amplified or implanted at earlier ages should, as a

result, present with superior academic achievement outcomes. Marschark et al. (2007) caution the assumption that technologies providing for improved hearing will intrinsically be followed by enhanced language skills and achievement, as current literature does not support this claim.

Access to Highly Skilled Educators. The primary focus of this disquisition is mitigating students' reduced access to highly skilled educators. Working to prepare children and young adults who are D/HH to become contributing citizens, successfully transitioning to post-secondary education or lucrative employment presents a challenge when one must first focus on growing students' basic communication skills. Doing so requires highly skilled educators knowledgeable of the implications of hearing loss, language development, language deprivation, and the exceptional learning needs of students who are D/HH. These educators must also be vested in the notion that their work makes a difference in students' lives.

Students who are D/HH are educated in a continuum of placements, ranging from full-time regular education without accommodations, to full-time separate/residential schools for the D/HH. Placement in special education is interpreted by individual states. North Carolina deems the regular educational placement, according to the continuum of placements as the least restrictive environment (LRE) (DPI, 2018). Here, the definition of 'least restrictive' centers on the amount of time a child is removed or 'restricted' from their typically developing peers. Most children who are D/HH, more than 85%, spend all or part of their school day in regular education schools (U.S. Government Accountability Office, 2011). In Deaf education, though, experts emphasize that the typical

interpretation of LRE for students who are D/HH is placement in a language rich environment (Lederberg et al., 2013).

The prevalence of individuals studying deaf education and becoming ToD/HH is declining. National findings concerning training programs indicate that about a fourth of college programs offer concentrations in deaf education, compared to the population of university teacher preparation programs offered in deaf education in the 1970's (Dolman, 2010). At present, the numbers are fewer. Currently, only one university in North Carolina offers a teacher certification program in deaf education. Further, quality teacher preparation programs are those that successfully build the capacity of individuals to teach and teach well. Unfortunately, Darling-Hammond and Youngs (2002) found that many teacher preparation programs often bypass foundational aspects of teacher preparation and graduate students who view themselves as underprepared, are thought less- adept by school administration, are generally ineffectual with students, and have high rates of leaving the profession. Darling-Hammond (2000) observed that educator preparedness serves as an intense connection to academic achievement, notwithstanding controls for students' socioeconomic and language status.

Teachers are the education professionals in closest, daily proximity to students. Thus, teacher capacity is surely a central factor in academic achievement. Numerous research findings support teacher effects as the dominant influence on students' educational gains (Wright et al., 1997). Educators must be well-versed to evaluate students' needs and identify and employ appropriate, evidence-based interventions, in every presented opportunity. Unfortunately, many educators lack the capacity to meet these challenges.

Understanding individual student needs and employing research-informed pedagogy are not only central in effective teaching but mandated by our nation's most recent education laws. *Every Student Succeeds Act* (2015) requires states to ensure the implementation of practices that are "evidence-based". Such practices are defined as those activities, strategies and interventions demonstrating a statistically significant effect on increasing student achievement, based on strong, moderate, or promising evidences (Darling-Hammond et al., 2016). Nevertheless, research supports that as well-prepared ToD/HH graduate and move into positions, they often fall into the school's culture, taking on the beliefs, assumptions, attitudes and activities of those around them, and abandoning the implementation of evidence-based practices they were taught to employ (Easterbrooks et al., 2009).

Educators and educational entities recurrently provide students who are D/HH with a diluted program of study, holding them to lower expectations. Tucker (2014) maintains that "connecting students who are D/HH to academic rigor seems a rare concept in the field of deaf education" (p. 90). A deficit-focused ideology, as defined by Gorski (2011), honing educators to approach teaching based on their perceptions of students' weaknesses, rather than students' strengths, limits exposures to academic rigor and subsequent accomplishment. With a deficit-based ideology, educators are not asking themselves how *they* can do better.

Systems and policies are not in place to bolster attainment for these students, implying that individuals who are D/HH and their accomplishment is not valued. The opportunity gap is further broadened, and gross inequities persist for this populace.

The Local Context

The North Carolina School for the Deaf

The North Carolina School for the Deaf (NCSD), the preeminent day and residential school for children who are D/HH in North Carolina was the setting for improvement efforts of this disquisition. NCSD was established in 1894 and remained the only school of its kind for D/HH children in North Carolina for 70 years. NCSD serves children in PreK-grade 12, ages 3-22, from the western-most 47 counties of North Carolina. NCSD employs 23 ToD/HH for its current population of 85 students, boasting a student-to-teacher ratio of 4:1.

The student make-up at NCSD is pointedly diverse. Figure 4 below illustrates NCSD students' demographics.

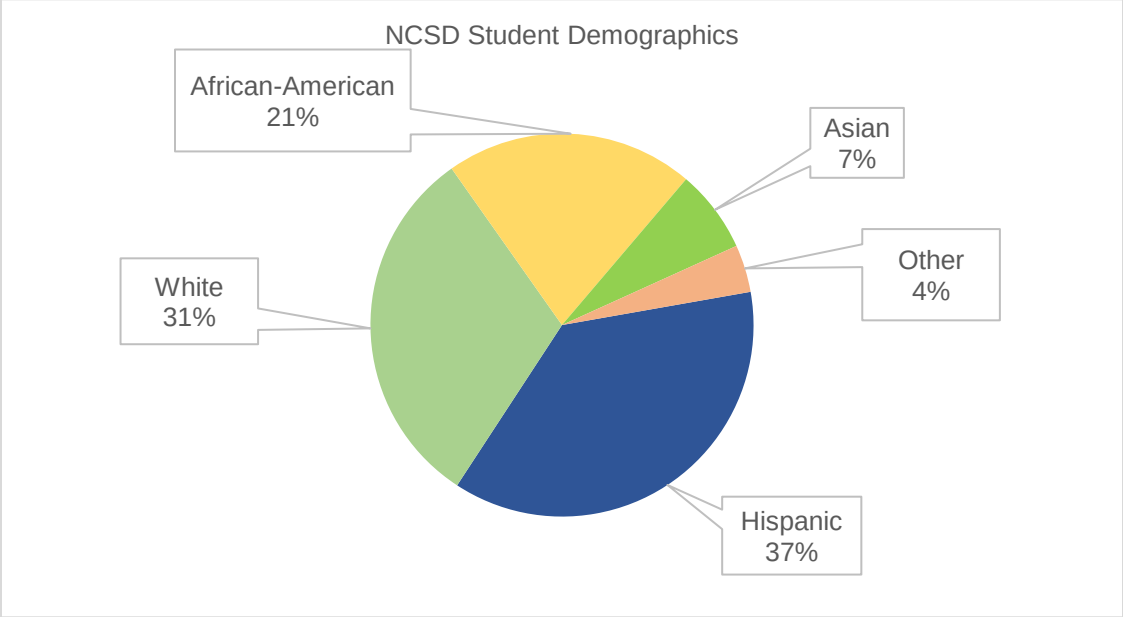


Figure 4. Demographics of NCSD students.

Likewise, NCSD students vary in their representation of eligibility categories for specially designed instruction (SDI). Each student is eligible for SDI and all students at NCSD carry primary or secondary eligibility areas of Deafness or Hearing Impairment. Additional primary or secondary special education eligibilities of NCSD students include Deaf-Blind, Developmental Delay, Intellectual Delay, Autism, Social Emotional Disability, Multiple Disabilities, and Traumatic Brain Injury. Figure 5 below portrays student representation respective to eligibility categories.

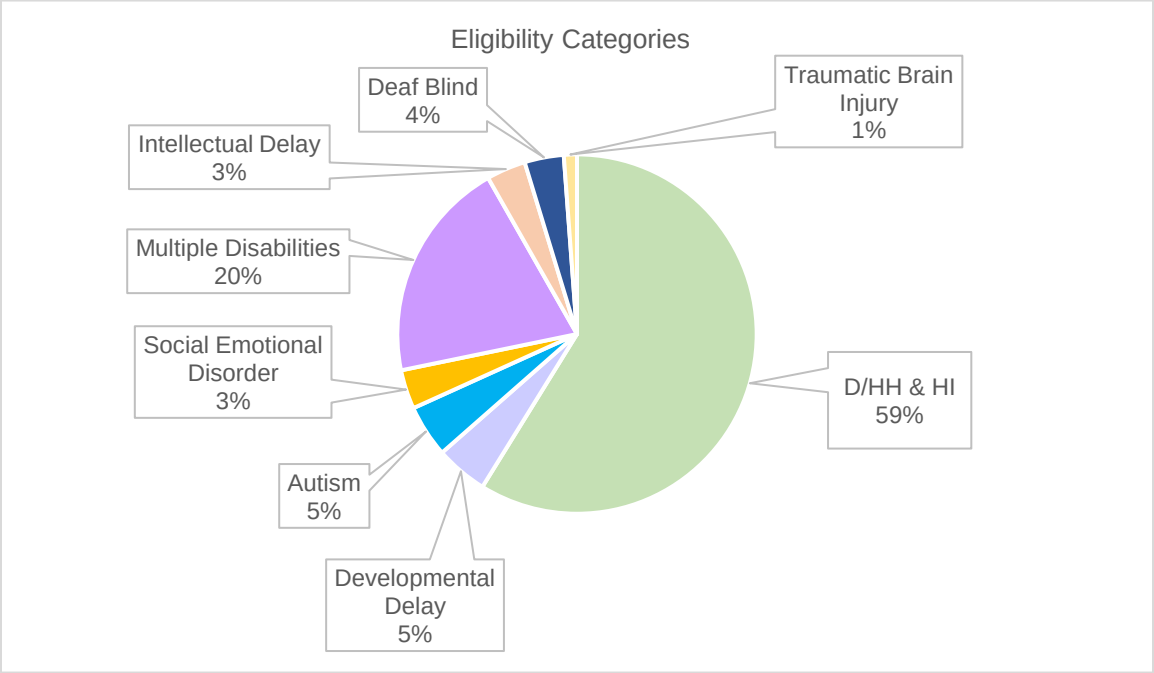


Figure 5. Eligibility categories of NCSD students.

NCSD asserts dual accreditation by AdvancedED and the Conference of Educational and Administrators of Schools and Programs for the Deaf (CEASD). The school is dedicated to persistently advancing the immediate and long-term results of its

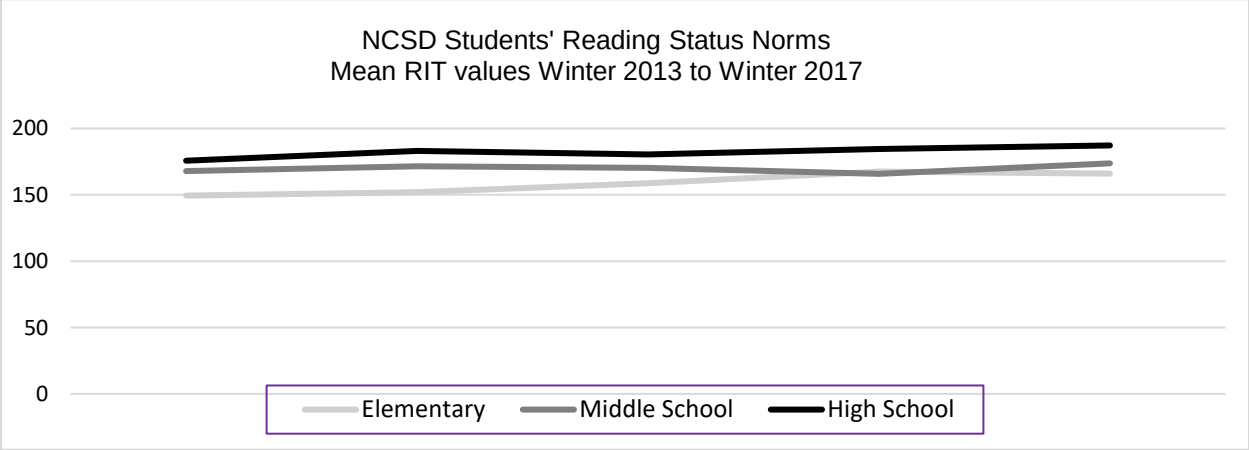
students as well as educational and post-secondary outcomes of all students who are D/HH in western North Carolina through outreach and support efforts.

Despite a commitment to excellence, NCSD students' academic achievement outcomes are not dissimilar from national averages. Concerning literacy, students' scores on North Carolina's End-of-Grade (EOG) English Language Arts (ELA)/Reading Achievement assessments in grades 3-8, on average, are consistently Level I and Level II, achievement ranges denoting limited and partial command of knowledge and skills. Similarly, high school students' results of the English II End-of-Course (EOC) assessment are consistently Level I and Level II, gain pointing to limited and partial command of knowledge and skills concerning the ELA North Carolina Standard Course of Study (NCDPI/North Carolina Testing Program, 2014).

To address students' achievement in language and literacy, NCSD adopted use of the Northwest Education Alliance's (NWEA) Measures of Academic Progress (MAP®) in 2013, with rationale that doing so would provide for personalized learning. NWEA MAP® is a suite of assessments proven to precisely measure individual students' functioning, growth, and skill aptitudes. The assessments, designed for K-12 students, are sampled from between 3.6 and 5.5 million scores from 500,000 to 700,000 students in attendance in 24,500 public schools across all 50 states. The assessments are adaptive, instantaneously regulating the following question, according to the student's previous answer, and arriving to a measure of the student's current level of achievement. The MAP® Growth student data provides information in Rausch unITs or RIT scores that illustrate normative stable achievement.

MAP® Growth assessment results provide information concerning skills attained and stimulability for new skills that are student specific. Instructional areas are classified by learning standards and objectives are further sorted per standard. Reading informational text, for example, presents the aims of determining cause and effect, following directions, locating information, sequencing, inferencing, determining supporting details, and reading text features and visuals. These are further concentrated to specific skills. Text features and visuals, for instance, lists 'locates information in charts or graphs' as a specific skill. Students' individual, relative strengths and areas of focus are identified per standard. Specific skills that are 'ready to introduce, develop, and reinforce' are outlined in the MAP® Growth Student Profile, supporting teachers' planning for personalized learning and focused instruction.

Historical data of derived Rausch unITs (RIT) or stable achievement scores renders that NCSD students have consistently scored well below their assigned grade-level equivalency in reading. Figure 6 below illustrates NCSD students' stable achievement data 2013-2017. For comparison, a RIT or stable achievement score of 203.6 in reading is a mean that translates to a mid-year grade 4 reading level.



READING	W13	W14	W15	W16	W17
2-5	149.4	152.0	158.7	167.5	165.9
6-8	167.9	171.4	170.3	165.8	173.7
9-12+	175.7	183.0	180.5	184.5	187.2

Figure 6. Reading status norms. A historical view of NCSD students' stable reading achievement, 2013-2017.

As in the general field of education and deaf education, teachers and administrators at NCSD have been unsuccessful in identifying and executing interventions to promote momentous change in students' language and reading abilities and subsequent academic achievement. In fact, NCSD professionals are inclined to expect and stomach that student performance on state-mandated tests will reflect limited or partial command and achievement on school-wide assessments will present well below their assigned grade level. Professionals rationalize acceptance, given these assessments are administered in students' secondary language, (written) English. A primary goal, though, for students at NCSD is to become proficiently bilingual, able to communicate effectively in both American Sign Language and via written English.

As previously conferred, language and literacy proficiencies determine a student's success in all school subjects. When compared to non- D/HH persons, Garberoglio et al. (2016) describe greater high school and college dropout rates, lower employment rates, and more frequent occupation in menial positions for persons who are D/HH, illustrating a significant opportunity gap. Inadequate language and literacy skills equate to poor achievement, limiting opportunities to further one's education, and in an atmosphere of audism, contributes to restrictions in employability and independence.

Acknowledging that a perpetual opportunity gap exists, an injustice for persons who are D/HH, is the rationale for prioritizing the problem of dismal achievement. The students at the NCSD need and deserve equitable opportunities to realize their full potentials.

Theory of Improvement and Proposed Improvement Initiative

Drivers of Change Process: What change might I introduce and why?

My theory of improvement held that: *Equipping educators to identify, choose, and implement evidence-based interventions, with support, would enhance their self-efficacy and ability to meet the immediate language and literacy-learning needs of students who are D/HH, thus mitigating disparate academic performance outcomes.*

The causes for disappointing academic achievement outcomes for students who are D/HH are certainly intricate. Directing the experiences of all children who are D/HH to ensure early and complete access to communication, with satisfactory language models mediating their daily interactions with the world would be idyllic but was unachievable. Byrk et al., (2015) acknowledges that a working theory of practice improvement requires prioritizing that which is plausible. In my context and within my locus of control, was ensuring that children who are D/HH attending NCSD are met by highly capable educators who understand and support their exceptional learning needs with interventions and practices informed by evidence. For this improvement initiative, I focused on the aspects pertinent to enhancing educator efficacy through capacity development. I aimed to upsurge the academic achievement of students who are D/HH, by amplifying students' access to highly skilled educators, those individuals most instrumental in students' learning.

Figure 7 is a *driver diagram* (Byrk et al., 2015). This is a logical organization of change, a diagram of practice improvement, focusing on drivers and associated change ideas. The succeeding representation illustrates suppositions and transformations precisely contributing to the aim of improving English Language Arts (ELA) achievement outcomes for students who are D/HH.

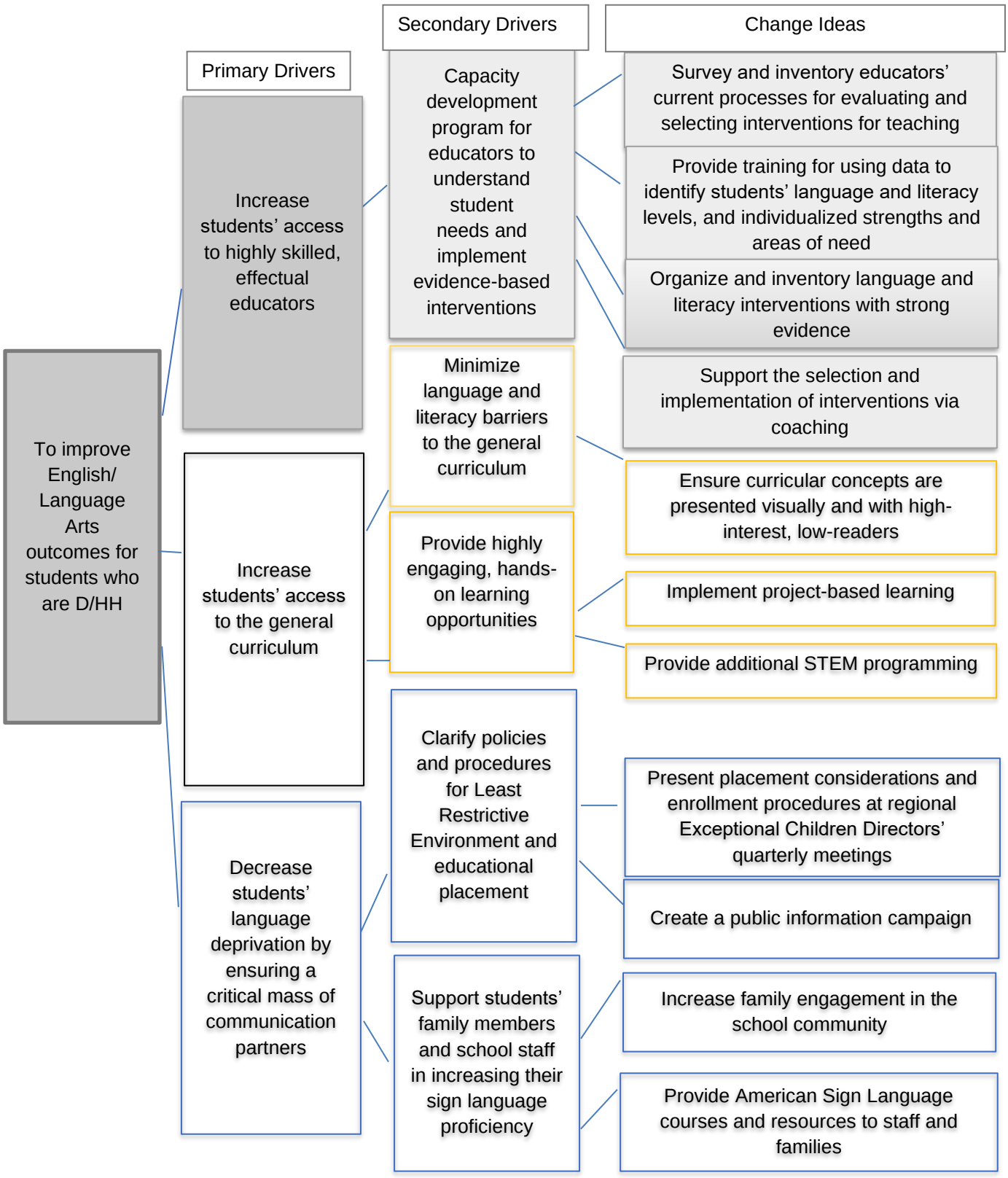

Primary Drivers
Secondary Drivers
Change Ideas
To improve English/ Language Arts outcomes for students who are D/HH
Increase students' access to highly skilled, effectual educators
Increase students' access to the general curriculum
Decrease students' language deprivation by ensuring a critical mass of communication partners
Capacity development program for educators to understand student needs and implement evidence-based interventions
Minimize language and literacy barriers to the general curriculum
Provide highly engaging, hands-on learning opportunities
Clarify policies and procedures for Least Restrictive Environment and educational placement
Support students' family members and school staff in increasing their sign language proficiency
Survey and inventory educators' current processes for evaluating and selecting interventions for teaching
Provide training for using data to identify students' language and literacy levels, and individualized strengths and areas of need
Organize and inventory language and literacy interventions with strong evidence
Support the selection and implementation of interventions via coaching
Ensure curricular concepts are presented visually and with high-interest, low-readers
Implement project-based learning
Provide additional STEM programming
Present placement considerations and enrollment procedures at regional Exceptional Children Directors' quarterly meetings
Create a public information campaign
Increase family engagement in the school community
Provide American Sign Language courses and resources to staff and families

Figure 7. Theory of practice improvement. Driver diagram illustrating theories and change ideas for the improvement initiative.

Following deliberation of the various drivers to enhance academic performance for students who are D/HH, I determined that ensuring students' access to highly skilled educators by increasing teacher capacity was the most impressionable driver. The exceptional language and literacy-learning demands of students who are D/HH necessitate well-honed, effectual educators. I suggested that providing a strong, research-informed capacity development program would enhance educators' overall self-efficacy and capacity to determine the skills and needs of students, choose and implement evidence-based interventions, and collect and analyze data to inform ongoing reflective, responsive pedagogical practice. The schemata below, Figure 8, provides a wide-angle perspective of the improvement initiative I proposed.

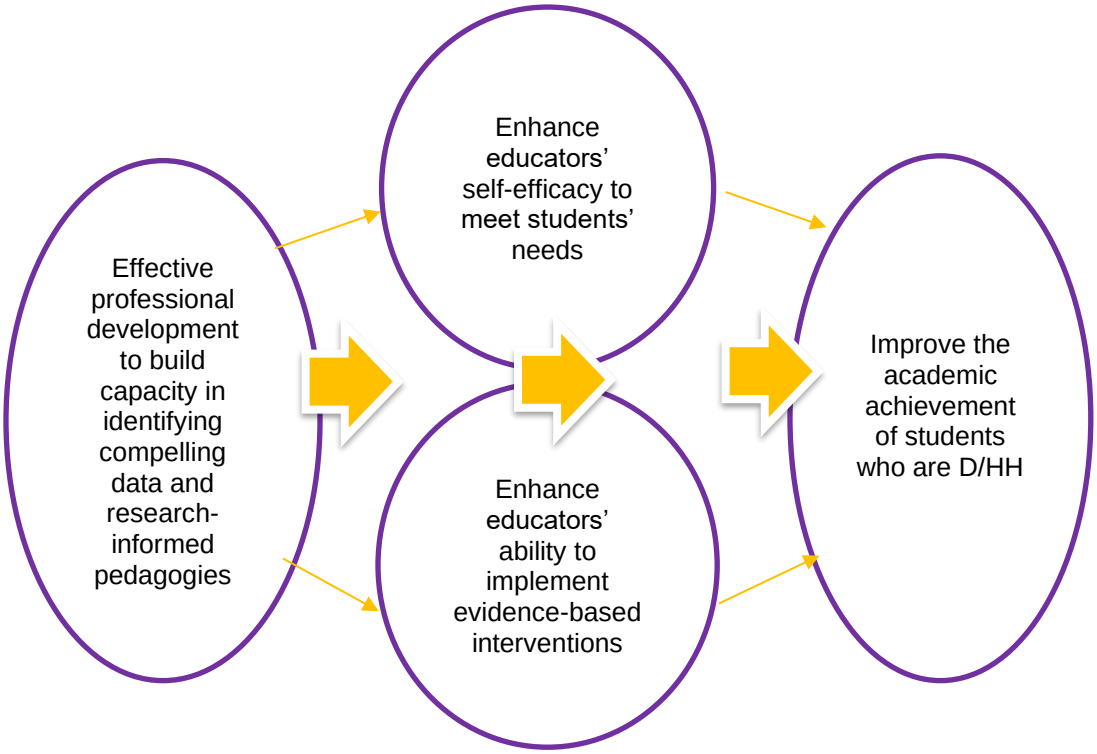


Figure 8. Improvement initiative schemata.

I hypothesized that providing focused, effective capacity development for educators, consisting of specific training in analyzing stable achievement data and identifying and implementing appropriate research-informed pedagogical approaches would support educators in honing individualized student goals. Further, offering an inventory of interventions with strong research evidence and providing peer and administrative coaching in the selection and implementation phases would strengthen the capacity of teachers and, in turn, improve the academic achievement of students.

I presented both the driver diagram and the improvement schemata to my design team. We referenced the causal analysis and agreed that the drivers that emerged were those that could be leveraged locally. I explained my rationale for a focus on building capacity in educators, citing evidence to support educators' self-efficacy and effectiveness as key influences on student achievement. The team approved that this was in fact the driver most readily influenced. I discussed the secondary driver of employing evidence-based interventions and supporting research and legislation. Associated change ideas were offered. The team appreciated that change ideas addressed language and literacy and were specifically enamored by the idea of being able to offer an inventory of practices founded in the evidence base to teachers. The team asked for more information about the planned coaching sessions. I explained that these would be individualized, based on the needs of teachers in implementation.

Primary Drivers

Educator Self-Efficacy. A foundational aspect of educator capacity is self-efficacy. Teacher quality considerations encompass several concepts, characteristics, and measures in the research literature, but a teacher's perception of their ability to affect

positive change is significant. Self-efficacy can be impelled by deficit thinking. Thus, introspection concerning educators' opinions about the abilities of students and themselves, how these beliefs came to be, and how they influence teaching is worthy.

The construct of educator self-efficacy stems from social cognitive theories. Bandura's (1977) self-efficacy theory holds that the strength of a person's conviction about their own effectiveness directs their willingness to cope through given situations. Do teachers make a significant difference in the lives of their students? Is every student truly able to learn and achieve? Can the focus and skill of highly effectual educators, despite seemingly insurmountable environmental odds, positively influence learning and yield meaningful achievement outcomes? These are the questions posed of self-efficacy.

It is apparent that the beliefs individuals claim concerning their own value to others are highly predictive of their behavior (Goddard et al., 2000). Bandura (1981) supports that educators' sense of their personal and teaching abilities drives their efforts, actions, and persistence. Allinder (1994) summarizes, "Teachers with a low sense of teaching efficacy do not exert much effort or persist for an extended period because they do not think students are learning or can learn. Teachers with a low sense of personal teaching efficacy may believe that although students can learn, they themselves do not have the skills or resources to teach them" (p.86). Rationally, teachers with a strong sense of efficacy affirm that their efforts will be impactful, trust that their students can learn, exert effort when planning and teaching, and persist through difficulty. Educator efficacy, low or strong, can be infectious to a school's climate and sways student efficacy in either a discouraging cycle of failure or a confident upswing of achievement (Bandura, 1997).

Educator Effectiveness. Goe and Stickler (2008) provide a focused definition of teacher effectiveness, describing "the degree to which teachers contribute to their students' learning, as indicated by higher-than-predicted increases in student achievement scores" (p. 2). Promoting the quality of educators, a sure method to improving education and student achievement, was legislated via the No Child Left Behind Act of 2001, which called for each classroom in America to be equipped with a "highly-qualified" educator. The role of teachers' influence on academic achievement is clear. Hightower et al., (2011) outline findings in scholarly research, regarding the general importance of quality teaching and assert that the clearest impacts of in-school personnel on student learning and achievement are teachers and school leadership, and the cumulative effects of having a qualified teacher can be gauged and have been found to be extensive. Rockoff (2004) confirms that nurturing teacher quality is certainly a catalyst to improving student outcomes. Advocating for highly effectual educators is a worthy focus and meaningful leverage to influence changes in students' overall achievement.

Secondary Drivers and Change Ideas

Employing Research-Based Interventions. Effective teachers identify students' individualized needs and implement interventions founded in research to meet learning needs. McClure (2018) holds that quality research-informed pedagogy has real potential to improve student outcomes, specifically those with socioeconomic, cultural, and linguistic challenges.

Legislation demands the use of evidence-based interventions. The No Child Left Behind Act of 2001, Public Law 107-110, revised the Elementary and Secondary Education Act (1965), with amendments to back practices founded in the educational

research base (Fitzpatrick and Theoharis, 2014). The inauguration of the Institute for Education Sciences (IES) exemplifies the push for evidence-based interventions in education and more recently, the focus of legislation has taken to *use* of research (Farley-Ripple et al., 2018). The Every Student Succeeds Act (ESSA), tasks states and local education agencies to identify and replicate proven, evidence-based interventions to enhance students' performance outcomes (Sharp, 2016). ESSA further specifies meticulousness in research by presenting tiers of evidence, stipulating that educators employ the strongest models "most likely to improve student outcomes" (ESSA, 2015).

Language. We know that the most significant implication of hearing loss is the eminent impact on language access and acquisition, as most children who are Deaf/HH experience scarcities in communication interchanges (Luckner, Bruce, et al., 2016). Research indicates that a few things are certain, regarding evidence-based intervention in promoting language acquisition. Early and consistent access to adequate language models is essentially the stand-alone best practice in language acquisition for children who are DHH. Ensuring consistent stimulation via adequately accessible communication partners, environments, and technology, when appropriate, is foundational but not always within the locus of control for professionals. Thus, a reasonable emphasis for this improvement initiative are those evidence-based practices for improving language and literacy outcomes for students who are DHH.

Literacy. The complexity and extent of one's vocabulary certainly affects the ability to communicate, understand what is read, and flourish educationally (Luckner & Cooke, 2010). It is necessary to address the well-established interdependence of

language, vocabulary and literacy, as linguistic prerequisites are required for developing print literacy.

Print vocabulary. As previously discussed, the act of learning communication vocabulary is oft an incidental occurrence. With optimal conditions in language learning environments, children learn communicative vocabulary through natural interaction with and the support of skilled language models. But what evidence-based practices support DHH children to develop English print vocabulary? Many experts agree that direct vocabulary instruction supports students in learning high-frequency words, those that appear most often in texts read, as well as those words that present complex ideas that are not encountered in our everyday lives. Teachers often use word banks, word walls, print memory games, and timed reading lists to make sight vocabulary available and practice for fluency (Luckner & Cooke, 2010). While direct instruction in the recognition of and drill concerning sight words fosters early success on assessments of those measures, it is not a strategy with direct evidence linking to print vocabulary fluency and enhanced print literacy skills.

The semantic approach to print vocabulary instruction is an evidence-based practice substantiated by various well-known authors. Easterbrooks and Stephenson (2006) support this approach as one of the ten more frequently referenced practices in literacy instruction, citing three major components: integration, repetition, and meaningful use. The semantic approach seeks to enhance the knowledge of DHH learners concerning figurative language (multiple meaning words, idioms, and the concrete and abstract meanings of words). Semantic and word maps may be incorporated, helping to relate vocabulary to the student. Luckner and Cooke (2010)

agree that using semantic maps and visual organizers in vocabulary instruction supports connections. Semantic maps provide a visual display, connecting concepts and key vocabulary, encouraging active thinking, and providing exposures to conceptually related vocabulary.

Additional visual-based strategies have been cited as evidence-based practices for vocabulary learning for children who are DHH. Fingerspelling, where the manual alphabet represents the orthography of English, supports children in learning the structures of words, such as syllabication and the pairing of consonant clusters. Strong connections are evident between fingerspelling skills and English reading vocabulary for children who are DHH (Lederberg et al., 2013).

Visual input via teaching morphology is an additional theme that emerged from the research. Luckner and Cooke (2010) advocate teaching students visual, word learning strategies that involve the study of morphological clues, such as prefixes, suffixes, and root words, supports success, as words become more and more abstract through the school years. Likewise, Lederberg et al. (2013) confirms that "explicit instruction on morphology can provide DHH children an additional sublexical basis for word identification and generation" (p. 23). Print vocabulary and its critical role in reading comprehension is clear. Professionals should ensure evidence-based interventions are employed to strengthen print vocabulary, in preparation for mapping additional reading and learning strategies to ensure success in school.

Reading strategies. In a research brief, Morere (2011) outlines the reading research concerning DHH children. Not surprisingly, she alludes to a strong language foundation, regardless of modality, and parental involvement. When parental or

professional fluency exists, children who are DHH can engage in shared reading experiences. Luckner and Cooke (2010) address the importance of being read to and sharing books and Easterbrooks and Stephenson (2006) agree that shared, collaborative reading has a strong evidence basis for developing readers. Storytelling, being read to, and reading to others are facets of shared reading. Rich experiences with shared picture books and later, positive language skills are strongly correlated in multiple studies (Luckner, Bruce, et al., 2016).

A final theme associated with positive literacy outcomes references metacognitive reading strategies. Easterbrooks and Stephenson (2006) outline that metacognitive reading strategies provide explicit steps for use in constructing meaning from text and entail re-reading, referencing picture cues, predicting, and visualizing to support reading comprehension. In accordance, Luckner et al. (2016) validate that children who are DHH benefit from "activation of background knowledge prior to reading activities, explicit instruction in strategies for comprehension, and using modified directed-reading thinking activities" (p. 230).

A focus of the proposed improvement initiative was to identify practices in language and literacy that represent an evidence-base and thus, are trusted in implementation. I theorized that providing an inventory of research-informed practices for language and literacy would support educators' capacity to identify, choose, and implement suitable interventions and bring about significant results.

Supporting Implementation via Coaching. The link between scholarly research and best practice in education lies in implementation (Cook & Odom, 2013). Teaching is a dynamic and complex profession. Educators need continual support to progress

skillfully. Coaching is a proven practice that supports educators to "…develop and apply new knowledge, make strong plans for instruction and assessment, obtain feedback, refine their practices, and examine results" (Coaching for Impact, p.3). Wood et al., (2016) examine the role of multi-level coaching in promoting educators' use of evidence-based practice in education. They maintain that in-service professional development alone is not enough to foster the enhancement of instructional skills and argue that additional influence via coaching is necessary. Multi-level coaching, as described, encompasses professional development, follow-up coaching by a supervisor, and side-by-side coaching for those educators who require more support. Much like providing multi-level interventions with students, educators benefit when the nature of support provided is individualized. Providing the appropriate follow-up coaching is a force to increase educators' use of practices with strong evidence, while positively influencing student achievement outcomes.

Improvement Methodology and Design

Design Team

In improvement methodology and design, the concept of networked improvement communities (NICs) is important and describes a group of people organized to resolve a common problem (Byrk et al., 2016). My improvement initiative employed a small networked improvement community or what I will refer to as my design team henceforth. That team included the following members: Arielle Pask M.S. CCC-SLP, NCSD Speech and Language Pathologist (SLP), Thea Wilson Au. D, NCSD Audiologist, Daphne Peacock, M.A., a Teacher of the Deaf (ToD) who teaches science grades 3-8, and Emily Bishop, M.A., a Teacher of the Deaf (ToD) for grades K-2. There were two additional

design team members at the start of this project, Sarena Fuller, M.A. formerly NCSD's Interim Director and School Principal, and Jenna Owens, M.A., formerly NCSD's Behavior Specialist, but both past design team members accepted positions elsewhere in the spring and fall of 2019, respectively.

Each member of the design team has considerable knowledge of deaf education and instruction in language, reading, and literacy. Arielle, our SLP also served as a co-investigator on the project. In addition to supplying praise and criticism and helping to steer design and implementation, she obtained consent and completed some observation and coaching sessions. Thea, our Audiologist, and both ToD, Daphne and Emily, served as sounding boards and provided significant feedback at each step, but did not have a role in implementation. I lead the design team, providing the auxiliary research and improvement science tools for problem analysis and improvement design. I designed and presented professional development sessions, completed observations, and provided coaching in implementation.

Improvement Initiative

The improvement initiative consisted of a focused and contextual capacity-building program targeting teachers' use of available stable achievement data via Measures of Academic Progress (MAP®) Growth assessments and teachers' abilities to identify student performance and set goals for reading and language usage instruction. Secondly, addressing and growing educators' capacities to identify and employ relevant evidence-based interventions for language and literacy instruction. A final layer of the initiative targeted teachers' implementation of evidence-based interventions, with the support of a coaching model.

Implementation Plan

Initial Implementation Plan.

Proposed Implementation Timeline											
	February	March	April	May	June	July	August	September	October	November	December
Design Team											
Design Team meetings	X	X	X	X	X	X	X	X	X	X	X
Educator Capacity-Building											
Self-Efficacy Surveys			X								X
NWEA MAP® data analysis training			X				X				
Collate data and identify common instructional targets			X	X	X						
Inventory EBP with strong evidence					X	X	X				
Distribution of EBP inventory							X				
EBP trainings							X	X	X	X	
Pre- and Post-Training Quizzes			X				X	X	X	X	
EBP Observations							X	X	X	X	
NC Teacher Evaluation Process				X				X			X
Peer and Administrative Coaching							X	X	X	X	
Formative Data Collection (PDSA) Cycles			X				X	X	X	X	

Educator Interviews		X									X
Students											
NWEA MAPs				X				X			X
Student Survey			X								X
eleot®		X									X
Note: eleot® is the *Effetive Learning Environments Observation Tool by advancED.*											

Table 1. Action steps and initial timeline for implementation.

Implementation Timeline.

Actual Implementation Timeline												
	2019					*2020*			*2021*			
	August	September	October	November	December	January	February	March	January	February	March	April
Design Team												
Design Team meetings	X	X	X	X	X	X	X	X	X	X	X	X
Educator Capacity-Building												
Self-Efficacy Surveys										X		
NWEA MAP® data analysis training					X				X			
Collate data and identify common instructional targets					X	X	X		X			
Inventory EBP with strong evidence						X	X		X			

Distribution of EBP inventory										X		
EBP training										X		
Pre- and Post-Training Quizzes										X		
EBP Observations										X	X	
Peer Coaching										X	X	
Formative Data Collection (PDSA) Cycles						X	X			X	X	X
Students												
NWEA MAPs				X							X	X
Student Survey										X	X	

Table 2. Action steps and actual timeline for implementation.

Implementation.

SMART Goals and Outcomes. The overarching, desired long-term outcomes of the improvement initiative were to improve English/Language Arts (ELA) outcomes for NCSD students by:

(1) Reducing the percentage of target students achieving a Level I or Level II, indicating limited and partial command of content, on state-mandated End of Grade (EOG) tests for grades 3-8 and the English II End of Course (EOC) test, to less than 60%.

(2) Reducing the percentage of target students whose Rausch unITs (RIT) or stable achievement scores per NWEA MAP® assessment depict below grade-level equivalency in reading to less than 50%.

The intermediate outcomes of the improvement initiative were to enhance educator's self-efficacy to meet students' needs and develop educator's faculties to implement evidence-based practices. Measurable short-term outcomes included:

(1) A pre- and post-quiz comparison will reveal increased teacher capacity to identify evidence-based practices in language and literacy instruction, as participating teachers will demonstrate a 10% or greater increase in their raw score, after participating in the professional development session.

(2) A comparison of teacher self-efficacy will reveal a mean difference pre- and post-marks

(before and after participating in the professional development session and subsequent observation and coaching sessions) that is statistically significant.

(3) A comparison of student self-efficacy will reveal a mean difference pre-and post-marks

(before and after students' teachers employ evidence-based teaching strategies) that is statistically significant.

Implementation Process. Design team meetings were held monthly, in the design and implementation phases. In late August 2019, I provided an introduction and overview of my proposed project. September 2019 and October 2019 meetings centered on review of the causal analysis (fishbone diagram), the improvement plan (driver diagram) and the improvement schemata. In mid-November 2019, students in grades 2-12+ participated in school-wide testing via the Northwest Education Alliance's (NWEA) Measures of Academic Progress (MAP®) Growth assessments. The design team met in late November 2019 to review various MAP® Growth summary reports and identify training

points. All NCSD ELA teachers in grades 2-12 received their students' reports and a refresher on reading and drawing conclusions from the MAP® Growth summary reports in early December 2019. In December 2019, I collated data from MAP® Growth testing results and identified common learning targets across grade levels and presented these via e-mail to the design team in January for endorsement.

The recurrent suggested areas of focus were: (1) Vocabulary: Acquisition and Use, (2) Informational Text: Key Ideas and Details, and (3) Literary Text: Language, Craft, and Structure. In January 2020 and February 2020, I researched and created an inventory of evidence-based practices concerning vocabulary and reading instruction to address suggested areas of focus that emerged from the student data and design team deliberations. For example, according to MAP® Growth data, many students presented 'ready to develop' skills in Informational Text: Key Ideas and Details. A specific skill associated was 'locating information from charts and graphs'. Here, metacognitive pre-reading strategies were relevant evidence-based practices to address these skills. Thus, various pre-reading strategies were recorded on the preliminary draft of the practice inventory.

I presented the inventory to my design team in February and received feedback. These are procedures that one takes to validate the instrument and ensure usability and clarity. I made changes to the layout and added an area for documenting frequency, based on my design team's suggestions. Also in February, review of International Review Board (IRB) items, including the application, recruitment notification, surveys, questionnaires, observation and coaching documents, and consent and assent forms occurred.

While awaiting IRB approval, I began creating the professional development program to suit the common learning targets and evidence-based practice inventory. In early March 2020, I received International Review Board approval. For both convenience and to ensure an electronic record trail between myself and possible participants, I e-mailed a recruitment message to six salient, ELA teachers at NCSD, inviting their participation. Right away, a seasoned high school ELA teacher expressed interest. The EBP professional development session was scheduled for mid-March 2020, however the world was quickly changing due to the COVID-19 pandemic. Schools closed to face-to-face instruction in mid-March. My own world was changing significantly, too and I was ready to announce my pregnancy. Our baby boy would be arriving in August of 2020.

The COVID-19 pandemic called for everyone and to pause. We were quarantining, sheltering in place, while trying to reinvent ourselves as educators. We geared up to provide some normalcy to our students, something that resembled school via remote instruction. We made numerous parent contacts for scheduling classes and related services. We discussed logistics for sending technology, paper and pencil packets, and meals to students. We sent Wi-Fi hot spots to students in isolated areas. We Zoomed. We completed weekly "wellness check-ins" with families of students not showing up for their classes and activities. Our focus was on preserving and nurturing the mental and emotional health of the students and families in our charge. It never felt appropriate to attempt moving forward with my research project in those months, in the face of a worldwide pandemic. Asking anything more of our teachers, our families, and myself, in those days, was illogical. There was too much uncertainty in the world. Instead, we halted and survived.

In the summer of 2020, after having a few months of learning more about the virus and some time for teachers and students to experience and become more proficient with remote instruction, I thought that a small-scale implementation might be possible. The teacher that had eagerly consented in March, just prior to school closing for the pandemic, a fellow 12-month employee, was still graciously willing to participate. Her available students' track records for participation via remote learning had been sporadic at best, in the spring. We could only imagine similar attendance or worse for extended school year (ESY) in the summer weeks.

Moreover, nesting and the bonus worries of expecting a baby in a pandemic proved to occupy more headspace than I had bargained. There was no room for scholarly inquiry or steering and overseeing an improvement initiative. Despite high hopes for the summer and completion prior to baby's arrival, implementation and proper measure was just not possible, regardless of scale.

We joyously welcomed our baby boy, Tucker Glenn Gunter, on Monday, August 24, 2020 at 12:34 a.m. I was granted Family Medical Leave (FML), beginning that day, until January 4, 2021.

I returned to work full-time at the beginning of January, while NCSD continued in full remote status. The school had re-opened for face-to-face instruction for most students in October 2020, with some students and families choosing to remain remote. The school closed to in-person instruction, though just before winter break, due to a large number of residential life staff having to quarantine, which of course impacted the safety and supervision of residential students.

I called a design team meeting in early January. We reviewed MAP® Growth data, previously determined learning targets, and the *Evidence-Based Practices Inventory*. We discussed next steps for implementation. I rescheduled the professional development session, initially, for the third week in January. In mid-January, I sent a recruitment e-mail to our now five ELA teachers. Also in mid-January, preparations were made to bring students back to campus for in-person instruction. Unfortunately, I was bumped from the professional development calendar in January, due to a paid consultant's need for a schedule change. My training was again rescheduled for early February.

The first week of February, I conducted the Evidence-Based Practices (EBP) in Language and Literacy for Students who are Deaf/HH training and presented the *Evidence-Based Practices Inventory* to NCSD ELA teachers via Zoom. Just prior to the training, my other investigator, Arielle Pask, obtained formal consent for participation in the study from all five willing teacher participants. Baseline data, including the pre-training quiz and the educator self-efficacy survey were distributed via e-mail and completed during an early break in the training session. Immediately following the training, the current practices survey, the *Evidence-Based Practices Inventory*, and the post-training quiz was distributed electronically to participating teachers. I analyzed baseline educator data from self-efficacy surveys and information from the pre- and post-training quizzes and presented findings to my design team via e-mail the first weekend in February.

Students returned to campus for in-person instruction the second week of February. Arielle and I organized and distributed electronic and hard copy materials for

parental consent and student assent, based on participating teachers their assigned students. Students completed initial self-efficacy surveys that same week. Observation and coaching sessions for targeted evidence-based practices ensued in the following and final weeks of February. Also in mid-February, I requested continuing review of my research project and documented progress to date via IRB.

Final self-efficacy surveys for participating ELA teachers and students were distributed in the latter part of the third week of February. Spring 2021 NWEA MAP® assessments for grades 2-12 were scheduled for late March and early April. I analyzed the available study data and readied relevant data representations the following weekend.

Formative Evaluation of Improvement Methodology

Insider Research

The North Carolina School for the Deaf (NCSD), the setting of my improvement initiative, is a culturally Deaf school. As a hearing person, with a lens of social justice and intention to improve outcomes for students who are D/HH, the transformative paradigm was expressly meaningful. It was necessary for me to remain cognizant of the rich history of Deaf culture and the plight of this marginalized group. I strived to build and maintain trusting relationships among design team members, with students, with families, with educators, and with the Deaf community throughout the processes of improvement. Serving as an insider-researcher in this sensitive, cultural context was confounded by my hearing status and my role in administration. However, one benefits of being an insider-researcher is previously established trust with colleagues. Considering possible slants in the research process, I engaged in careful self-reflection. I had to acknowledge my personal biases and perspectives and mitigate any likely angsts

with having membership in the community that I am researching (Dwyer & Buckle, 2009). I remained aware of the life experiences of D/HH colleagues, the existing opportunity gap between hearing and D/HH individuals, and the resulting constructs of reality. Carefully, I acknowledged the influence of power and privilege on those constructs. As Guardino and Cannon (2016) counsel, it was necessary for me to cultivate awareness of the lens through which I regard and define my own culture and others' cultures, ensuring respect for the needs and preferences of my students and colleagues when connecting in research and practice.

How will I know whether the change is actually an improvement?

Improvement Science. Foundational, for this improvement initiative, was the underpinning of improvement science. Bryk et al., (2015) describe improvement science as, "a methodology that disciplines inquiries to improve practice" and "a highly practical form of rigorous inquiry" (p.10). Projects that employ the principles of improvement science aim for continuous improvement that positions an educational entity to implement changes that results in dependable, esteemed outcomes for numerous student body subgroups.

Byrk et al., (2015) designate six principles essential for the execution of improvement science in complex organizations:

- Make the work problem-specific and user-centered.
- Focus on variation in performance.
- See the system that produces the current outcomes.
- We cannot improve at scale what we cannot measure.
- Use disciplined inquiry to drive improvement.

- Accelerate learning through networked communities.

Data Collection and Analysis

Table 3 below defines formative and summative data collection, frequencies, and methodologies used for analysis.

Data Collection and Analysis			
	Measure	Collection Frequency	Analysis
Outcome			
	NWEA MAP® Growth Achievement Data	2	Repeated Measures ANOVA
	Educator Self-Efficacy Questionnaire	2	Paired Sample T-test
	Peer and Administrative Coaching Comments/Reflections	1	Sentiment Analysis
Driver			
	Pre-and post-training assessments	2	Comparison of Raw Scores
Process			
	EBP Observations	1	Direct Observation
Balancing			
	Student Self-Efficacy Formative Questionnaire	2	Paired Sample T-test

Table 3. Practical Measures. Data collection measures, frequency, and analyses.

Practical Measures. Improvement science necessitates practical measurement. In addition to and in the context of cyclical inquiry, it was necessary to employ formative evaluations, the principles of practical measurement via outcome, driver, process, and balancing measures. These serve to determine that an implemented change in fact resulted in an improvement. Both qualitative and quantitative methods, in a transformative mixed methods design, was used. Creswell (2015) suggests that mixing qualitative and quantitative methods at the design level, is particularly useful when examining interventions, allowing for both data sets (qualitative and quantitative) to inform processes and support outcomes.

Balancing Measures. Balancing measures assess other segments in complex systems. The possibilities of unintended consequences resulting from improvement efforts were monitored via balancing measures. Students' attitudes and beliefs concerning language and literacy-learning were monitored pre- and post-implementation, ensuring capacity-building efforts with teachers did not have unintended consequence on students' perceptions of self-efficacy and their attitudes and opinions about learning. The Self-Efficacy Formative Questionnaire (Gaumer- Erickson & Noonan, 2018), found in Appendix C, asked students to rate, on a Likert scale, statements of confidence and about learning, persistence, and success. The questionnaire was offered, with read aloud via sign language as an accommodation, upon their request.

Driver Measures. Driver measures assessed change and were prognostic of the outcome measures. Developing educators' abilities to match and implement evidence-based practices, based on individual student need, were the anticipated changes in this initiative. Pre- and post-training quizzes were relevant driver measures, intended to

gauge the success of the professional development presentation in developing educators' knowledge base. The Evidence Based Practices in Language and Literacy Strategies Quiz, or Appendix D, assessed immediate changes secondary to the professional development presentation.

Process Measures. Fidelity is central in process measurement, determining if a change is being implemented as purposed. Focused teacher observations and peer and administrative coaching followed training sessions on evidence-based practices to ensure the instructional practices presented were implemented with compliance in educators' work with students. Appendix E, the Evidence-Based Practices Observation Form and Appendix F, the Evidence-Based Practices Coaching Form provided structured forms for direct observation and discourse analysis, ensuring anticipated interventions were implemented with conformity and evaluating educators' attitudes and beliefs concerning implementation.

Outcome Measures. In improvement science, the outcome measures serve two distinct purposes: (1) providing baseline data to illustrate the problem and (2) assessing the overarching aim of the improvement initiative. Cultivating highly effectual educators who could enhance the academic achievement outcomes in English/Language Arts (i.e. language and literacy) for students who are D/HH was the definitive aim of this work. Thus, an evaluation of educators' perceptions of self-efficacy and any change therein via the Teacher Self-Efficacy Questionnaire (Appendix B), adapted from Tschannen-Moran and Woolfolk Hoy's Teachers' Sense of Self-Efficacy Scale, was necessary. This measure poses teachers to determine "how much they can do" to motivate students, use assessment information to inform practice, and match those targets with practices with an

evidence-base. Further, baseline student achievement data via the Northwest Education Alliance's (NWEA) Measures of Academic Progress (MAP®) and state-mandated Reading EOG assessment and English II EOC assessment performance illustrate the current state of the problem. Revisiting these quantitative measures at the close of the improvement initiative should point to the accomplishments and insufficiencies of the project.

Formative Methods. Measures of formative data throughout the improvement initiative included surveys, pre- and post-training quizzes, and observations and coaching sessions, concerning the evidence-based practice training. Formative evaluation informs practice in improvement science and serves to articulate and test change theories (Gruno, 2015). The iterative nature of improvement science and the results of formative evaluation measures compelled next steps in training and implementation.

Disciplined inquiry is a key approach to improvement research that supports "learning fast and implementing well" (Bryk et al., 2015). The Plan-Do-Study-Act (PDSA) cycle is a fundamental form of inquiry, following systematic investigation, and guiding precipitous learning. Using hypotheses to guide improvement and gathering data to test changes and inform next steps, PDSA cycles guide the implementation of designated change ideas and provide measurement for improvement.

With this, the work of implementation was embedded in successive PDSA cycles. The first began with organizing available student data, cataloguing, and presenting relevant evidence-based practices for language and literacy in inventory form. The next cycle occurred in the context of designing and delivering a training program concerning

evidence-based practices. The final PDSA cycle occurred as investigators supported the employment of those practices via observation and coaching.

PDSA Cycle I: Organizing, Researching, and the Inventory

Figure 9 below depicts the first PDSA cycle.

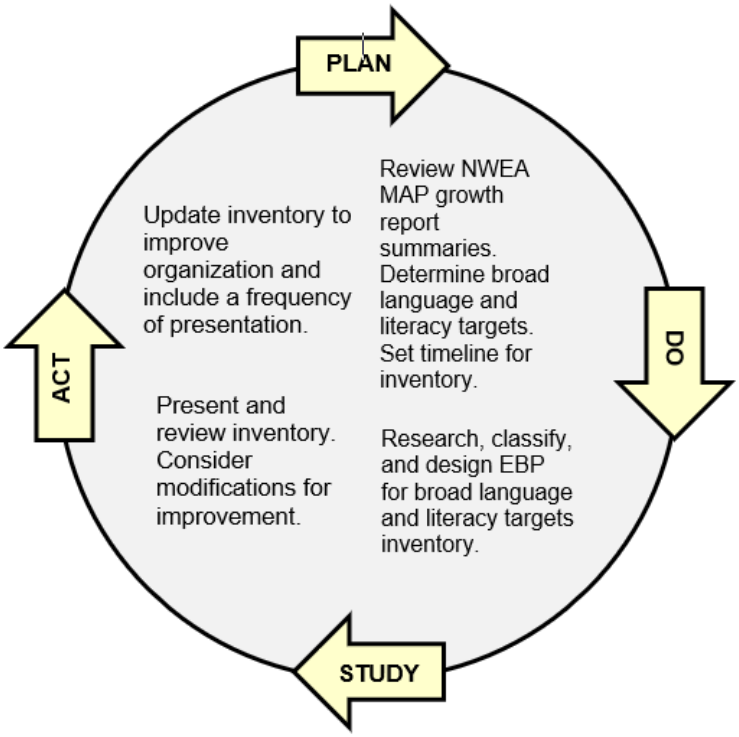


Figure 9. PDSA cycle I.

Following students' NWEA MAP® Growth assessments, in December 2019, I began gathering and organizing students' baseline data via their Rausch unIT (RIT) or stable achievement scores and suggested areas of focus for reading, as mentioned above. I presented this data to my design team and we agreed to center evidence-based practices on the recurrent areas of focus: (1) Vocabulary: Acquisition and Use, (2) Informational Text: Key Ideas and Details, and (3) Literary Text: Language, Craft, and Structure. We

decided on a general timeline for completing and introducing the evidence-based practices inventory, in conjunction with the professional development session.

Question One: What are we trying to accomplish?

- Ascertain common language and literacy targets and determine complementary evidence-based practices for the inventory and professional development session.

Question Two: How will we know that a change is an improvement?

- We predicted that our teachers would support the suggested areas of focus as areas representative of common and worthy targets for language and literacy. We theorized that offering a time-saving inventory of complementary evidence-based practices would encourage teachers to choose and implement appropriate interventions with strong evidence.

Question Three: What changes can we make that will result in an improvement?

- Provide teachers with an inventory of evidence-based practices so that they may readily choose and employ these in their everyday work with students.

PDSA cycle I – **Plan.** NWEA MAP® Rausch unIT (RIT) scores and the growth report summaries provided the necessary data to plan targets for instruction. Next, in planning was anchoring broad targets with specific objectives and delineating language and literacy interventions with strong evidence. The team agreed on tentative dates for completion and study of the inventory and tentative dates for completion and execution of the demonstrative training session.

PDSA cycle I – **Do.** I researched, classified, and designed the initial evidence-based practices inventory. I presented the product to my design team via e-mail and scheduled a team meeting to follow.

PDSA cycle I – **Study.** We met as a design team and reviewed the inventory together. Valuable suggestions by team members brought the realization that modifications to the organizational layout were needed, to increase clarity. The team also suggested that a frequency log be added to copies of the inventory (i.e. a method of documenting teachers' use of evidence-based practices from the inventory). Although feedback from the group proposed changes, the team agreed that the overall inventory would prove to be a useful tool for classroom teachers.

PDSA cycle I – **Act.** The design team study of the original inventory was used to create an updated inventory, improving the organizational layout and adding a record of frequency. This, in turn, steered the organization and creation of the related professional development presentation. We learned from the beginning PDSA cycle that frequency of teacher presentation would be a factor. From this, we knew that suggesting frequency of use of the evidence-based practices would increase the likelihood of teachers' success utilizing the inventory and practices in their work with students.

PDSA Cycle II: Evidence-Based Language and Literacy Practices Training

Figure 10 below depicts the second PDSA cycle.

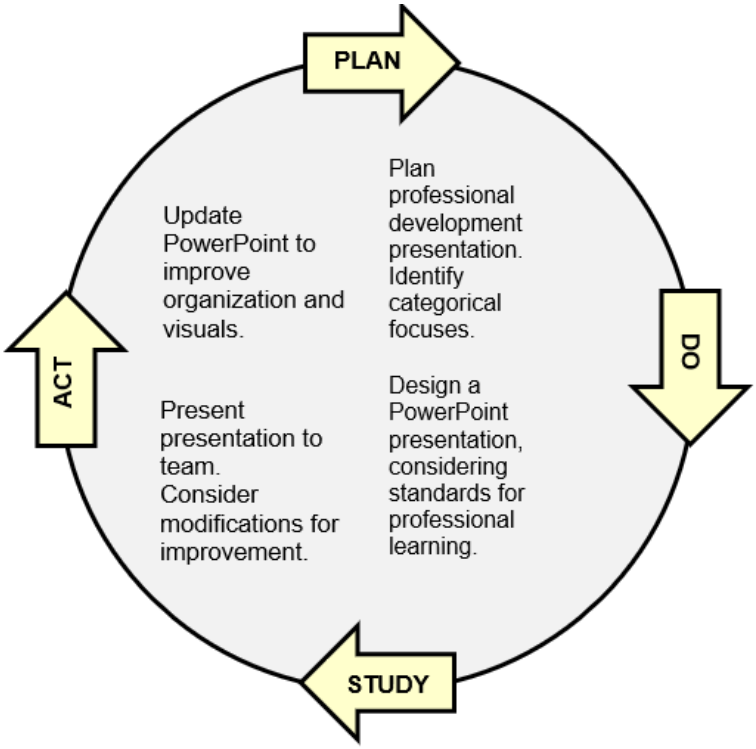


Figure 10. PDSA cycle II.

With the *Evidence-Based Practices Inventory* complete, I began building a befitting professional development program. I presented an outline to my design team in February 2020, proposing that content and the language and literacy practices from the inventory be presented via two broad categories of relevance, (1) Print Vocabulary and (2) Reading Strategies. We agreed that I would design the presentation anticipate offering the training in mid-March 2020.

The commencement of PDSA Cycle II is the precise point in the project that both life and a pandemic happened. Both ushered a hiatus, but at a retrospectively suitable place in the project, a safe pausing point, if you will, in the middle of the "do", where responsibility fell on me and no timeline (barring on-time graduation) constrained my work in this phase. Upon my return to work from maternity leave, I met with my design team in mid-January 2021 and reviewed the project's progress to date, refreshed

everyone's memory regarding the *Evidence Based Practices Inventory*, and presented an overview of the presentation I had created. My design team extended their approvals and the professional development session was offered in early February 2021.

Question One: What are we trying to accomplish?

- Confront the primary driver of teacher capacity-building by creating and presenting a

  training, demonstrating evidence-based practices from the *Evidence-Based Practices Inventory* that emerged from the previous PDSA cycle.

Question Two: How will we know that a change is an improvement?

- We projected that providing educators with a training specifically demonstrating the language and literacy practices listed on the evidenced-based inventory would increase the likelihood that they would implement, with confidence, those interventions in their work with students. We theorized that teachers' responses and scores to a pre- and post- training quiz would exemplify the change as an actual improvement.

Question Three: What changes can we make that will result in an improvement?

• Provide a professional development session to expand and support teachers' knowledge base of various practices with strong evidence corresponding to students' identified areas of focus. Deliver direct training via demonstrative teaching of evidence-based practices from the inventory.

PDSA cycle II – **Plan.** The *Evidence Based Practices Inventory* provided a menu of learning targets and complementary practices for training. I considered what may support an effective presentation of training content and consulted my design team with a

suggestion of grouping practices. I landed on the two major focuses of print vocabulary and reading strategies.

PDSA cycle II – **Do.** With two categories of practice in focus and borrowing from Learning Forward's Standards for Professional Learning (2011), I designed a PowerPoint presentation and outlined distinct opportunities for discussion and active engagement of participants, inviting educators to share their experiences with each practice so that the group could own and co-construct their knowledge of the evidence-based practices of focus.

PDSA cycle II – **Study.** We met the week prior to the professional development offering. I presented the completed slides in handout form and answered my design team members' specific questions concerning the presentation. The team made a few suggestions regarding ensuring the presentation would be adequately visual and Deaf-friendly for our Deaf educators, specifically in the remote presentation environment. We discussed the logistics of presentations presented directly via sign, received visually, and/or utilizing sign language interpreters and the various courtesies (i.e. allowing for adequate time for participants to pin interpreters raising your hand and identifying yourself when signing/speaking, allowing for one person to speak/sign at a time, and etc.) necessary for ensuring full communication access for Deaf participants in a remote presentation environment. It was helpful to talk through these points with my design team. I made minor adjustments, adding slides and visuals to denote the active engagement segments, and shared the presentation with would-be interpreters.

PDSA cycle II– **Act.** The Evidence Based Practices Inventory was shared with participants electronically on the morning prior to the scheduled professional

development session. Via Zoom, I conducted the training. I presented the content in spoken English and relied on two sign language interpreters to translate English to American Sign Language for me and voice interpret for my Deaf colleagues. I suggested participants use a split-screen view in Zoom. I gave an introduction overview, then activated prior learning and invited participation via the pre-training quiz, Evidenced-Base Practices in Language and Literacy Strategies Quiz. I proceeded in presenting the content of the inventory, demonstrating and providing visuals and examples. We had learned from the PDSA cycle that it would be helpful to include visuals to denote when opportunities for active engagement and discussion were forthcoming. These proved effective tools in the training, as anticipated and all participants engaged in sharing their experiences with various practices.

PDSA Cycle III: Evidence-Based Practices Observations and Coaching

Figure 11 below depicts the third PDSA cycle.

Figure 11. PDSA Cycle III.

After presentation of the professional development session, NCSD was able to bring students back to campus the following week, the first full week of February 2021. This coincided seamlessly with planning to support educators' use of evidence-based practices in the classroom via observation and coaching. Again, borrowing from Learning Forward's Standards for Professional Learning (2011), we understood that ensuring new applications of learning and producing long-term, continuous change and improvement in practice requires backing, productive feedback, and reflection. With this we set out to outline and schedule observation and coaching sessions.

Question One: What are we trying to accomplish?

- Provide support for professional learning and lasting practice change by observing and coaching teachers using practices and interventions from the *Evidence-Based Practices Inventory*.

Question Two: How will we know that a change is an improvement?

- We envisioned that providing observations and coaching the use of targeted language and literacy practices would help teachers refine and sustain their use. We speculated that teachers' responses to a self-efficacy survey pre- and post-training and simple interview questions regarding coaching sessions would support would characterize the change as an actual improvement.

Question Three: What changes can we make that will result in an improvement?

• We anticipated that scaffolding teachers' application of professional development content through structured observation and coaching would result in improvement.

I designed and presented to my team observation and coaching forms to guide the work of peer and administrative observation and coaching.

PDSA cycle III – **Plan.** Using the broad categories of print vocabulary and reading strategies delineated for the previous training, I created forms for investigators to use for structured observation and coaching. These were presented electronically to my design team for feedback. The forms were approved for use. I created a schedule for completing observations, sharing with teacher participants, and adjusting as needed, to ensure there were no unforeseen conflicts.

PDSA cycle III – **Do.** As investigators, Arielle and I completed observations of teachers in their classrooms. We were able to, despite a hectic week of back-to-in-person-instruction, catch teachers engaged in at least one trained practice concerning print vocabulary or reading strategies.

PDSA cycle III – **Study.** We discussed our various observations with each other and updated the design team via e-mail, concerning specific strategies observed and plans to continue support via coaching. Through observation, we noticed that a few quick and easy print vocabulary strategies were not appreciated in any of our observations. Those were explicit presentation of vocabulary via fingerspelling (Allen, 2015) and giving students a working definition, and then requiring that students retell the meaning in their own terms, a semantic approach. These are practices easily embedded in contextual learning across subject areas and settings, and we knew that they would prove immediately beneficial. We resolved to coach those two practices, “sandwiching” of target vocabulary (fingerspell-sign-fingerspell) and a semantic approach. In addition, we

discussed that we would provide individual feedback and expansions based on the strategies, print vocabulary or reading, that we had observed educators using.

PDSA cycle III– **Act.** We scheduled and completed coaching sessions. We created and distributed a simple visual to accompany our coaching efforts, reminding educators, and cueing students to sandwich vocabulary. We logged teacher comments concerning the coaching sessions and invited educators to record and e-mail any additional comments or reflections.

Summative Evaluation of Improvement Methodology

Methodology

I employed transformative mixed methods in the evaluation of my improvement efforts. Creswell (2011), describes mixed methods design as supporting an increased understanding of research problems, enabling scholars to prioritize data, determine parameters of data-generation necessary, and integrate and connect data to advocacy theories. Mertens (2007) holds that transformative mixed methodologies enable researchers to simultaneously respect and tackle issues in culturally complex settings, supporting positive social change. Reflective of transformative methodology, I substantiated qualitative measures with cyclical, quantitative findings (Mertens, 2012).

How will I know whether the change is actually an improvement?

Summative Methods. Byrk et al. (2015) maintains that improvement in complex organizations cannot occur at scale if it cannot be measured. Continuous and reliable improvement requires summative evaluation. Culminating evaluation was necessary in review, to determine the overall value and effectiveness of the improvement project. The aim of the initiative was founded on the hypothesis that educators could be equipped and

supported to identify, choose, and implement practices founded in evidence, which would enhance their perceptions of their own efficacy and in turn, their faculties to meet students' language and literacy learning needs. Building the capacity of educators in this way would theoretically result in a lessening of students' disparate language and literacy outcomes.

Summative outcome measures proposed to illustrate improvement included an analysis of teacher participants' comments concerning the professional development program (qualitative), pre- and post- self-efficacy surveys (quantitative), and an examination of students' stable achievement scores via NWEA MAP® Growth assessments scores pre- and post- implementation (quantitative).

Participants involved in the collection of data during the summative evaluation process, included the primary investigators on the project, myself and Arielle Pask. We solicited responses to the self-efficacy scales at the onset of the project from students and teachers. Unfortunately, we were only able to obtain post-implementation survey results from teachers in a time frame adequate for reporting.

Summative Evaluation Results.

To abridge, the proposed improvement initiative addressed the opportunity gap for individuals who are D/HH, a marginalized group. To combat disparate achievement and consequential restrictions in adulthood for this population, I proposed to enhance students' access at NCSD to educators able to meet them where they are and employ interventions established in research, supporting substantial growth in language and literacy. This, I suggested, would manifest in improved overall academic achievement

and would break down the barriers provided by the current opportunity gap for these individuals.

Quantitative. Quantitative methods of data collection specific to students proposed included a comparison of NWEA MAP® Growth RIT or stable achievement scores, with study via a Repeated Measures ANalysis Of VAriance (ANOVA) and analysis of self-efficacy surveys, pre- and post-implementation, studied via a Paired Sample T-test. Unfortunately, due to necessary adjustments, scheduling conflicts, and testing calendar changes prompted by the COVID-19 pandemic, each quantitative point of data salient to students is belated and outside of the reporting timeline for this disquisition.

Quantitative methods of data collection specific to teachers included ratings of their perceived self-efficacy on surveys pre-and post-implementation, with analysis via non-parametric descriptive statistics. A repeated measure self-efficacy survey, adapted from the Teachers' Sense of Self-Efficacy Scale, served to quantify the effectiveness of the comprehensive professional development program. The questionnaire was given at the beginning of the professional development session and again, following supported implementation by means of observation and coaching. Teacher participants were asked to complete the post-survey within two days following their coaching session. Both assessments were distributed via Qualtrics in February 2021. Descriptive statistics was utilized to compare teacher participants' responses pre- and post- implementation to answer if a difference in marks emerged following implementation. I anticipated that, following completion, teachers would report increased marks in "how much they can do", reflecting growth in perceptions of self-efficacy among participants.

The subsequent table presents pre- and post-implementation means and standard deviations for teacher participants' responses to each of the nine questionnaire prompts concerning "how much they can do".

Questionnaire Prompt: ***How much can you do?***	Pre-Implementation	Post-Implementation
	Mean/SD	***Mean/SD***
To motivate D/HH students showing little to no interest in school work	6.00/.82	6.75/.50
To get students who are D/HH to believe they can do well in school	6.75/.50	7.25/.50
To help your students who are D/HH value learning	5.50/.58	6.50/1.29
To use a variety of assessment strategies with D/HH students	6.50/.58	7.50/.58
To effectively utilize assessment information identify appropriate learning targets for D/HH students	6.00/.82	6.75/.96
To effectively utilize assessment information to inform instruction of D/HH students	6.00/.82	6.50/1.29
To assist families in helping their D/HH children do well in school	5.25/.50	6.00/.82
To identify relevant evidence-based practices for teaching D/HH students	7.25/.50	7.5/1.0
To implement relevant evidence-based practices in the instruction of D/HH students	6.5/.58	8.0/.82

Note: Score range for each item, 1-nothing and 9-a great deal.

Table 4. Descriptive statistics: Teacher self-efficacy means and standard deviations.

Using the anticipated paired samples analysis ultimately proved inappropriate for this project, due to a small sample size of four teacher participants. I had anticipated that the difference in means between the pre- and post- assessments would prove statistically significant. The subsequent analysis shows a 7.25 point mean average change with a *t* statistic, t = 9.667, probability or p-value, p = .002., and degree of freedom, df = 3. Figure

12 below depicts the Paired Samples Test via SPSS and Figure 13 provides Paired Samples Correlations.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre- and Post-	7.25000	1.50000	.75000	4.86317	9.63683	9.667	3	.002

Figure 12. Paired samples test.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre- and Post-	4	.985	.015

Figure 13. Paired samples correlations.

I had theorized that a comparison of teacher self-efficacy would reveal a statistically significant mean difference pre- and post-marks, before and after participating in the professional development and subsequent observation and coaching sessions. Due to the COVID-19 pandemic and resulting changes in overall implementation and data collection, an adequate sample size was not achievable and I am unable to draw conclusions and confidently report from inferential statistics. Although

available comparisons are promising, I am not able to ascertain that my theory of improvement held, moving teacher self-efficacy.

Qualitative. Summative qualitative data from observations and coaching sessions, one each per teacher participant, was judged via exploratory sentiment analysis, identifying and categorizing participants' comments as positive, negative, or neutral to understand their attitudes towards a topic or in this case, the overall capacity-building program. Table 4 below presents various examples of comments, statements, and reflections teacher participants provided verbally, via ASL, and in print during the supported (observation and coaching) phase of the professional development program, grouping them according to negativity, positivity, or neutrality.

Sentiment Analysis	
Sentiment	*Sentences/Phrases*
Negative	• How do we teach them if they don't know the underlying concepts, if they know nothing about it from experience? • Most of the reading strategies are difficult to use with emerging readers. Some students are just learning to read environmental print.
Neutral	• He requires differentiation to accommodate for his language needs. • We looked through my weekly lesson plans and identified 10 minutes of each day that I would designate for food vocabulary practice. • We've been previewing vocabulary for pre-reading The Outsiders. Language changes over time and some of the vocabulary included has a different connotation than today's use.
Positive	• Collaborating (with her) has proven beneficial. • Both students have demonstrated appropriate, spontaneous use of this vocabulary.

	• This made me look at my lesson plans and what opportunities I was providing for vocabulary. • Not much on the inventory is new knowledge but it was nice to have a list of practices in one place. • Shared reading is something we do naturally. It's fun for us and for students. • The inventory helped me individualize instruction for various learners. • Three students demonstrated mastery of 10 out of 10 vocabulary words by reading each word and providing an example in context.

Table 5. Qualitative Sentiment Analysis.

Many recorded comments and statements were positive in tone. Only two comments/questions were judged negative, and most statements extracted were judged either neutral or positive. Overall, judging by the language that participants used, their experience with the supportive phase of the professional development program resulted in positive feelings and emotions concerning use of the inventory and collaboration with investigators.

Figure 14 below illustrates the positive statements extracted.

Figure 14. Wordle of positive statements.

Summary of Results

In synopsis, Table 6 below represents a summary of results.

Subject	Summative Measure	Interpretation	Findings
Students	NWEA MAP® Growth Achievement Data	Repeated Measures ANalysis Of VAriance (ANOVA)	TBA
Teachers	Educator Self-Efficacy Questionnaire	Paired Sample T-test	There is strong evidence that the professional development program improved teachers' sense of self-efficacy.
Teachers	Peer and Administrative Coaching Comments/Reflections	Sentiment Analysis	Most of teachers' comments were with positive connotation.

Table 6. Summary of results.

While students' summative results are pending, a comparison of responses per the Educator Self-Efficacy Questionnaire and interpreted by a Paired Sample T-test revealed strong evidence that the professional development program improved teachers' perceptions of their own efficacy. Additionally, a sentiment analysis, which deciphered teachers' comments and reflections during and in response to peer and administrative coaching sessions, indicated most of those comments were positive in association.

Recommendations for Leadership Practice

I would recommend that leaders charged with improving outcomes for their students who are Deaf/HH consider first the fluency of students' classrooms. The most immediate need at the NC School for the Deaf and concerning educators' self-efficacy, though, is providing a fluent environment where all educators and school staff are fluent users of American Sign Language. Henner et al., (2016) justifies that for most D/HH children, their first systematic encounters with ASL and academic language is via entry to a signing classroom. Caselli et al., (2020) remind us that specialized schools and programs for D/HH children exist to provide language rich environments for students to learn ASL with a faculty abundant in know-how concerning the education of children who have already experienced language deprivation or are at risk.

Next for leadership, given strong initial results predominantly concerning the effect on teacher participants' perceptions of self-efficacy, I would recommend considering this initiative.

It has been well established in discussion throughout this disquisition project, the evidence base pointing to proven practices and interventions for D/HH students is existent but largely inaccessible. D/HH students are such a heterogeneous and low-incidence population. Empirical research studies necessary to substantiate practices and interventions with such a diverse population are particularly hard to replicate, contributing to the scarcity of the evidence-base. In contrast, data supporting teachers' positive sense of self-efficacy and its effect on student motivation and learning is well endorsed. Simply stated, an educator's perception of their ability to affect positive

change is momentous and teachers who believe they can productively affect students' achievement are more likely to do so.

Continued implementation and study in the present context is suggested. Subsequent iterative cycles are necessary to ensure fidelity of implementation of the complete set of commended evidence-based language and literacy practices. Continued observation and coaching, I conceive, would further participants' rising self-efficacy and would more likely ensure that practices are upheld in their application with students. Next, as teachers gain confidence and familiarity with the inventory and practices, additional tests of change should be introduced to scale the initiative to absorb teachers across all subjects and grade levels at NCSD. Perhaps, current participants, NCSD's ELA teachers, could serve as resident experts and complete observation and coaching sessions with their colleagues. Students and distinctively D/HH students are language and literacy learners in all subjects. Fostering prevalence in the use of practices with a pertinent evidence base will inspire overall student achievement and amplify students' access to highly effectual teachers, throughout their school day, the fundamental aim of this project.

Leadership Lessons Learned

First, the improvement tools utilized for this disquisition work, the causal analysis, driver diagram, and PDSA cycles of inquiry are effective, collaborative instruments for the work of improvement in educational organizations. Byrk et al., (2016) outlines the three "deceptively simple questions" that should guide all activity in improvement science: 1. What specifically are we trying to accomplish? 2. What change

might we introduce and why? and 3. How will we know the change is actually an improvement? (p. 114). These tools and queries are implements that I will continue to use in my leadership journey, seeking continuous improvement.

Sometimes, despite noble intentions and the best laid plans, there are variables that can prove significant and utterly out of a leader's locus of control. Last spring, all our lives changed tremendously. The global pandemic did contribute to a delay of this project, but my ultimate take away concerning leadership is that while plans may be thwarted, the work of improvement must continue.

Leaders cannot accept roadblocks to change and implementation as defeat. Nor can leaders pause with the realization of initial improvements. Instead, a disposition toward incremental, continuous improvement is vital. Park et al., (2013) deems true, incessant change as work that is founded in "frequency, depth, and system contextualization". Here, a culture of improvement must be recurrent in nature, integrated into individuals' daily work processes, and situated behind a systems lens.

Continued Scholarship

Obvious recommendations for continued scholarship, specific to D/HH students would converge on producing more empirical studies to identify practices with a strong evidence-base. Additionally, the relationship between Teachers of the Deaf's (ToD's) perceptions of their own abilities and student achievement would be an interesting direction for further research. Findings that point to the characteristics of educators with strong self-efficacy and the environments they thrive in, affecting positive student outcomes, may allow for reproduction.

With Theoharis and Scanlan (2015), I concur that continued scholarship should also focus on persistently "seeking out and widening the perspective of social justice leaders in the complexities of 21st century schools". The significant inequities in education, healthcare, and otherwise experienced by marginal populations further materialize in the face of a worldwide pandemic. Thus, I consider how this type of initiative might be adapted and used with other student groups who have been historically underserved.

Conclusion

For a population of students historically disregarded, such as D/HH students, the mission of continuous improvement, ever forward, is an urgent matter of social justice. I must reiterate that most (90%+) D/HH students are born to hearing parents who most likely do not know sign language and therefore begin their school years deprived of foundational linguistic skills and world knowledge (Spellun & Kushalnagar, 2018). Language deprivation and a historical culture of audism, discrimination of Deaf people due to beliefs that an inability to hear makes one inferior, has powered significantly inequitable achievement and employment outcomes for D/HH individuals (Bauman, 2004).

This disquisition sought to increase students at the NC School for the Deaf's access to highly effectual educators, well-versed in employing language and literacy practices founded in the evidence base, a pursuit of leadership to enable progress and enhance equity. D/HH individuals are markedly diverse with a variety of cultural values, assorted family communication choices, individual learning qualities, and child/family requisites. The heterogeneity of the D/HH community leads to practices and viewpoints that may fit one paradigm, but not another. Thus, *one-size-fits-all* practices are unrealistic for D/HH individuals (Hartman et al., 2019). Nevertheless, those of us responsible for the education of D/HH students must ask ourselves what we can do better. To quote Ron Edmonds, "There has never been a time in the life of the American public school when we have not known all we needed to in order to teach all those whom we chose to teach" (p.19) and whether or not we do depends on how we feel about the fact that we haven't so far.

As leaders for social justice, commanding not just schools and communities, but society (Lumby & Coleman, 2007), we must continue to use a systems lens to illuminate the poor conditions of current structures (i.e. school environments that are not fluent, students' limited access to highly skilled educators) that have failed, for decades, to adequately serve our D/HH students.

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Appendix A

Current Processes for Evaluating and Selecting Teaching Strategies and Interventions

1. What types of data do you use to determine students' current and needed language and literacy skills?

- ○ Accelerated Reading (AR)
- ○ Criterion-Referenced Quizzes and Tests
- ○ NWEA MAPs Student Profile Summary
- ○ Individual Reading Inventories
- ○ Work Samples
- ○ Observation and Anecdotal Notes
- ○ Cottage Acquisition Scales for Listening Language and Speech (CASLLS)
- ○ STAR Assessments
- ○ State-Mandated Tests (EOG, EOC, NCFE, ACT, EXTEND I, and etc.)
- ○ Other _____

2. How do you go about prioritizing and selecting skills to target in instruction?

_____

_____

_____

_____

_____

3. How do you select the teaching strategies and/or interventions you employ?

_____

_____

_____

_____

_____

4. What resources do you typically refer to when selecting the teaching strategies and/or interventions you employ with students?

- ○ Laurent Clerc National Deaf Education Center
- ○ American Speech and Hearing Association
- ○ ncpublicschools.org
- ○ Peer-Reviewed Journals (Please list)

_____

- ○ What Works Clearinghouse
- ○ Social Media (Pinterest, Facebook, and/or Twitter)
- ○ Internet Search
- ○ Colleagues
- ○ Other _____

5. How do you go about ensuring that the teaching strategies and/or interventions you employ with students are founded in evidence?

_____

_____

_____

_____

_____

6. Please list 5-7 evidence-based teaching strategies and/or interventions you employ regularly with students.

_____

_____

_____

_____

_____

Appendix B

Teacher Self-Efficacy Questionnaire

Instructions: Please indicate your beliefs concerning each of the statements below. Your responses should be honest representations of your beliefs about your own abilities to affect outcomes in your work with students. Your answers will be kept confidential.

	Nothing 1	2	Very Little 3	4	Some Influence 5	6	Quite A Bit 7	8	A Great Deal 9
1. How much can you do to motivate students who are D/HH, showing little interest in school work?	○	○	○	○	○	○	○	○	○
2. How much can you do to get students who are D/HH to believe they can do well in school?	○	○	○	○	○	○	○	○	○
3. How much can you do to help your students who are D/HH value learning?	○	○	○	○	○	○	○	○	○
4. How much can you do to use a variety of assessment strategies with students who are D/HH?	○	○	○	○	○	○	○	○	○
5. How much can you do effectively utilize assessment information identify appropriate learning targets for students who are D/HH?	○	○	○	○	○	○	○	○	○
6. How much can you do to effectively utilize assessment information to inform instruction of students who are D/HH?	○	○	○	○	○	○	○	○	○
7. How much can you do to assist families in helping their children, who are D/HH, do well in school?	○	○	○	○	○	○	○	○	○

8. How much can you do to identify relevant evidence-based practices for teaching students who are D/HH?	○ ○ ○ ○ ○ ○ ○ ○ ○
9. How much can you do to implement relevant evidence-based practices in instruction of students who are D/HH?	○ ○ ○ ○ ○ ○ ○ ○ ○

Adapted from: Teachers Sense of Efficacy Scale

Appendix C

Student Self-Efficacy Formative Questionnaire

Please CHECK ONE response that best describes you. Be honest, since the information will be used to help you in school and also help you become more prepared for college and careers. There are no right or wrong answers!

	Not very like me 1	2	3	4	Very like me 5
1. I can learn what is being taught in class this year.	○	○	○	○	○
2. I can figure out anything, if I try hard enough.	○	○	○	○	○
3. If I practiced every day, I could develop just about any skill.	○	○	○	○	○
4. Once I've decided to accomplish something that's important to me, I keep trying to accomplish it, even if it is harder than I thought.	○	○	○	○	○
5. I am confident that I will achieve the goals that I set for myself.	○	○	○	○	○
6. When I'm struggling to accomplish something difficult, I focus on the progress I've made instead of feeling discouraged.	○	○	○	○	○
7. I will succeed in whatever career path I choose.	○	○	○	○	○
8. I will succeed in whatever college major I choose.	○	○	○	○	○
9. I believe hard work pays off.	○	○	○	○	○

10. My ability grows with effort.	○	○	○	○	○
11. I believe that the brain can be developed like a muscle.	○	○	○	○	○
12. I think that no matter who you are, you can significantly change your level of talent.	○	○	○	○	○
13. I can change my basic level of ability considerably.	○	○	○	○	○

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Appendix D

Evidence-Based Practices in Language and Literacy Strategies Quiz

---

1. Please list any evidence-based practices for students who are Deaf/HH concerning direct English vocabulary instruction.

_____

_____

_____

_____

_____

2. Please list any evidence-based practices for students who are Deaf/HH concerning a semantic approach to English vocabulary instruction.

_____

_____

_____

_____

_____

3. Which of the following are examples of concepts taught in morphological English vocabulary instruction?

- ○ Prefixes
- ○ Suffixes
- ○ Root Words
- ○ Origins
- ○ All of the above

---

4. Which of the following visual supports help children who are D/HH learn the structures of English words, such as syllabication and the pairing of consonant clusters?

- ○ Conceptually Signed English
- ○ Fingerspelling
- ○ Cued Speech
- ○ Orthography

---

5. What are some benefits of shared reading?

_____

_____

_____

---

6. Which of the following are evidence-based, metacognitive strategies for pre-reading?

- ○ Previewing
- ○ Reading to Others
- ○ Activating Prior Knowledge
- ○ Explicit Instruction in Comprehension

---

7. Which of the following are evidence-based, metacognitive strategies that are recommended while reading?

- ○ Referencing Print and Picture Cues
- ○ Visualizing
- ○ Re-reading
- ○ Predicting

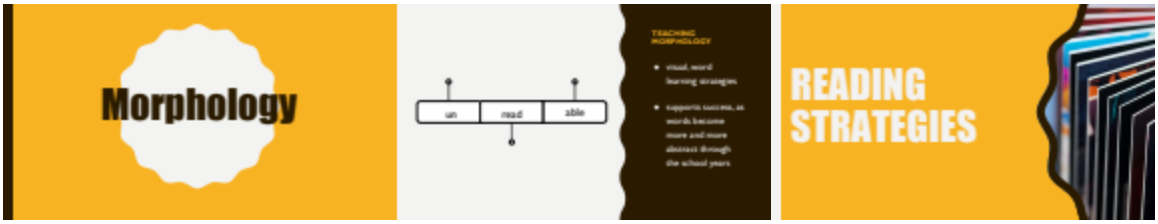
Appendix E

Evidence-Based Language and Literacy Practices for Students who are D/HH Presentation

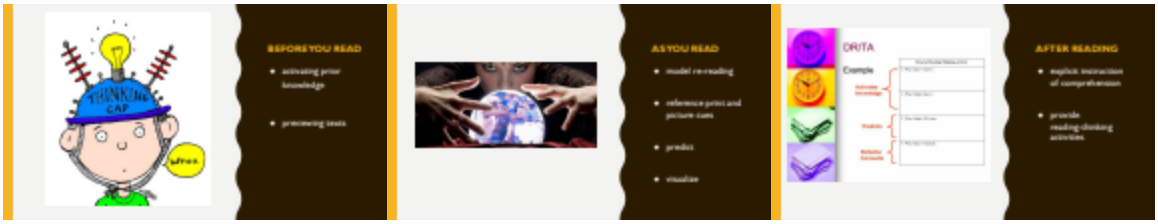

THINK
PAIR
SHARE


Semantic Approach
Winter
Thematic Units
Semantic Features


Semantic Maps, Word Maps, Concept Maps, and Visual Organizers
Fingerspelling
CITIES


Morphology
un
read
able
READING STRATEGIES


Shared Reading
Sharing Stories
Metacognitive Strategies


THINKING CAP
BEFORE YOU READ
activating prior knowledge
previewing texts
AS YOU READ
model re-reading
reference print and picture cues
predict
visualize
ORITA
Comple
AFTER READING
explicit instruction of comprehension
provide reading-thinking activities


References

Appendix F

Evidence-Based Practices Observation Form	
Observer:	**Date:**
Classroom Information	
Student(s):	**Subject/Topic:**
Instructional and/or Individual Student Goal(s) and Objective(s):	
Observation	
Duration *(circle one)*: 15 minutes 30 minutes 45 minutes 60 minutes	
Evidence-Based Language and Literacy Practices for Students who are D/HH Observed *(Please circle)*:	
Print Vocabulary:	**Reading Strategies:**
Direct Vocabulary Instruction • Word Banks/Word Walls/Print Memory Games/Timed Reading Lists Semantic Approach • Semantic Maps/Word Maps/Visual Organizers Fingerspelling Morphology • Prefixes/Suffixes/Root Words/Origins	Shared Reading • Storytelling/Read-Aloud/Collaborative Reading/Reading to Others Metacognitive Strategies • Pre-reading/Activating Prior Knowledge/Previewing • Re-reading/Referencing Print and Picture Cues/Predicting/Visualizing • Explicit Instruction in Comprehension/Directed Reading-Thinking Activities
Observer Comments and Recommendations:	

Appendix G

Evidence-Based Practices Coaching Form	
Coach:	**Date:**
Classroom Information	
Teacher:	**Student(s):**
Instructional and/or Individual Student Goal(s) and Objective(s):	
Coaching Duration *(circle one)*: 15 minutes 30 minutes 45 minutes 60 minutes	
Evidence-Based Language and Literacy Practice Coached *(Please circle)*:	
Print Vocabulary:	**Reading Strategies:**
Direct Vocabulary Instruction • Word Banks/Word Walls/Print Memory Games/Timed Reading Lists Semantic Approach • Semantic Maps/Word Maps/Visual Organizers Fingerspelling Morphology • Prefixes/Suffixes/Root Words/Origins	Shared Reading • Storytelling/Read-Aloud/Collaborative Reading/Reading to Others Metacognitive Strategies • Pre-reading/Activating Prior Knowledge/Previewing • Re-reading/Referencing Print and Picture Cues/Predicting/Visualizing • Explicit Instruction in Comprehension/Directed Reading-Thinking Activities
Teacher Comments and Reflection Concerning Coaching Session:	

Appendix H

Sample NWEA MAP® Student Profile Report